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MARCH, 1935

FOOD INDUSTRIES

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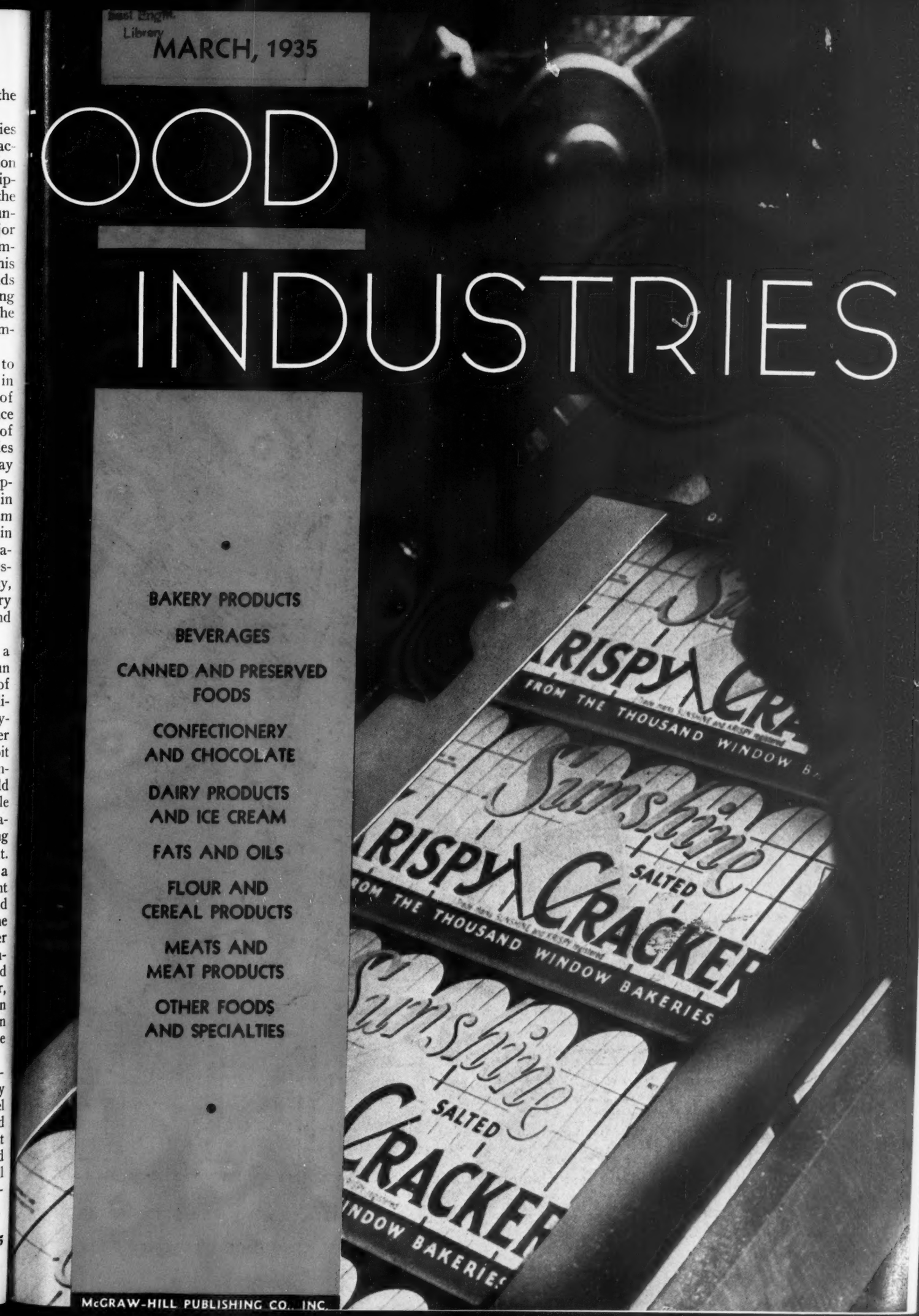

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FOOD INDUSTRIES

PRODUCTION • ENGINEERING • DISTRIBUTION

★

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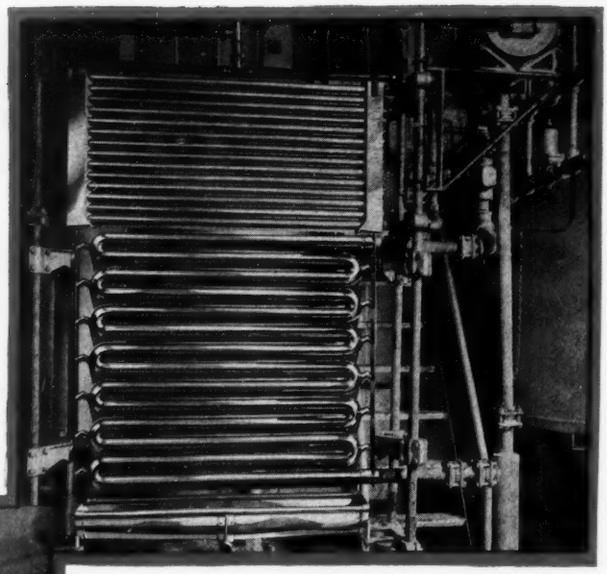

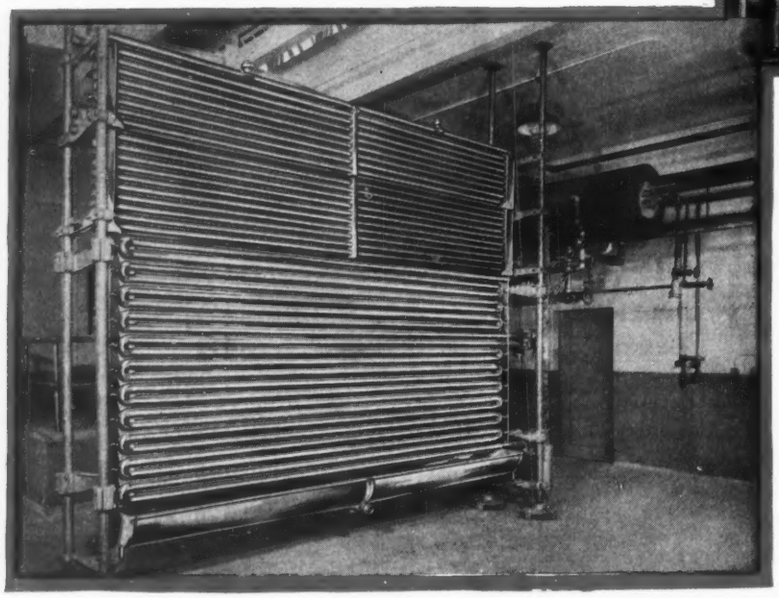

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FOOD INDUSTRIES

PRODUCTION • ENGINEERING • DISTRIBUTION

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Vol. 7, No. 3

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Laurence V. Burton, Editor

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MARCH 1935

THE TALK OF THE INDUSTRY

ALIBI NOTE: FOOD INDUSTRIES' prize for the worst alibi of the month goes to the route salesman and investigator for a dairy company. After a prolonged investigation (?) in response to a complaint that she had received a bottle of ropy milk, a good lady was asked to believe that somebody somewhere had put lemon juice into a milk bottle. Although

she is not quite certain just where, in the course of events, the lemon juice is allegedly supposed to have entered into the scheme of things, the idea seems to be dominant that someone stealthily squeezed a lemon before her front door.

WE FIND ourselves again in that perennial quandary which arises when someone requests a rational, reasonable, logical explanation of the acts and rulings of the Federal Government. It is all very quaint and confusing. Yet, to twit our Washington friends about it, brings only dark looks, sighs of solicitude about our mental state and, upon ourselves, a dawning conviction that there is a nice padded cell awaiting anyone who tries too long to make sense out of it.

Today's perplexities arise out of the fact that, if one wants to make orange wine, it is both legal and technically necessary to add sugar to the orange juice. But if the ultimate goal is orange brandy, which can only be made by distilling orange wine, then it is illegal to add the sugar; and he who sweetens his orange juice for this purpose is headed for the hoosegow. But he can't make brandy without the added sugar.

However, one may sweeten grape juice under the exemptions of Section 3255 of the Revised Statutes and still stay out of jail as far as the Treasury Department is concerned. But if he were to get a special dispensation permitting him to make orange brandy, which cannot be made without added sugar, he would still have the Food and Drug Administration to appease. According to their thinking right now, they would require it to be called "Sugar and Orange Brandy." But, of course, there is no sugar in brandy. Yet there is no such thing as commercial Orange Brandy unless

sugar has been added to the juice. So, legally, there can be no Orange Brandy, and you can't make brandy from sugar alone, and there is no sugar in brandy. . . .

But, of course, you get the idea. It is all very confusing.

IT SEEMS that the Harlem district of New York, that *locale* made famous by Amos and Andy, was considered to be the best market hereabouts for canned dog food at the time we made our study of the dog food business. Our investigation revealed that it was not the canine, nor yet the feline, population of Harlem that accounted for this unexpected demand, but that the negro population and some of the white folks of the district were buying it for their own consumption. (Stop us if you like dog food.)

Word now comes to us from Baltimore that the human market for dog

food has grown so rapidly that it has attracted the attention of the food authorities—state, local or federal, we are not sure which, although we suspect the proximity of Baltimore to Washington may be a contributing factor. At any rate, someone in official position has raised an official eyebrow and has persuaded some of the dog-food canners to put enough charcoal into the food to make it a very unappetizing gray color. We hope the charcoal burners are alert to the new market.

WHILE we ourselves could hardly be properly classified as purists in the use of our native tongue, we nevertheless experience a distinctly localized pain when we hear the word "demand" used so frequently in its current very loose sense. Labor "demands" this, manufacturers "demand" that, and the left wingers "demand" something else.

Demand is a pretty strong word: one not to be bandied about lightly.

In most negotiations, even when there is evidence of considerable heat, the participating parties are only asking, requesting, proposing. Only when one party has the other powerless to resist, it is then, and only then, that the dominating party is in a position to demand.

To cloak a proposal or a request in such vigorous language as a demand is only to arouse unnecessarily vigorous opposition and counter "demands."

Gold Clauses

NOW that the Gold Clause decisions by the U.S. Supreme Court are out of the way, this can no longer be an excuse for hesitation on the part of business men. The *status quo* of currency has been preserved. We do not need to re-adapt ourselves to another and different set of conditions. Business should now go on.

Be Sure to Attend

PRODUCTION DAY, at the Fifth Packaging Exposition and Conference, is of interest to every plant man and executive in the food industry who can get to the Palmer House in Chicago on Thursday, March 7. Discussions will cover Standard vs. Special Machinery, The Second Sale, Packaging Dry and Powdered Products, Use of Photo-Cell in Wrapping, and How Adjustability of Machinery Affects Packaging Cost. For the first time packaging as a factory operation receives a whole day on the program. Francis Chilson, well-known packaging engineer, will preside.

Code Enforcement

AN attorney of nationwide reputation recently confided in us his private conviction that codes can never be enforced by code authorities composed of business men. They have not the requisite legal powers or authority to call upon the strong-arm branch of the ordinary criminal police to enforce criminal statutes (which, believe it or not, is what codes are). And they lack the necessary zeal and freedom from other economic obligations for effective action. Law enforcement is something of a professional calling. And code enforcement must perforce be a wishy-washy affair until it is in the hands of the executive department of the government.

Kill It!

AGAIN before Congress is the 30-hour bill to prevent any worker putting in more than 30 hours of time per week. A proposal more dangerous economically than anything now pending—unless it be Dr. Townsend's pipe dream of $200 per month old age pensions—it will bankrupt industry if it ever becomes law.

Instead of lifting the country out of the depression, it will plunge us in deeper than anything we have previously known. Instead of creating employment it will raise costs to such heights that goods cannot be sold. Then will come more unemployment. The bill should be killed.

Less Gelatin

THE lay public will doubtless feel that it is benefited by the results of research at Massachusetts State College, which has proved the possibility of the method of cutting down gelatin in ice cream to one-fourth of the previous normal amount. Aging the mix at 68 deg. F. instead of the usual temperature of 38 deg. F. increases the efficiency of the gelatin about fourfold. (Experiment Station Bulletin 314.)

Because the colloidal-chemical purpose of gelatin in ice cream is misunderstood by the public, and sometimes overdone by equally uninformed manufacturers, it appears that the use of the least amount necessary will work for the ultimate good of all concerned.

Banking Law Changes

CENTRALIZING the control of our entire banking system in the hands of an administration-appointed Federal Reserve Board, as proposed in the new banking bill, is not good public policy. Only one thing could be worse—the centralization of control of education, although the effect of the latter would require decades to become manifest, in contrast to mere months for the former. Too much power has already been given to the Presidency, let alone giving it complete power over our banks and credit.

In his defense of the banking bill, Governor Eccles speaks of the use of Federal Reserve funds in the mortgage market, yet appears to be unfamiliar with the provision of Titles II and III of the Federal Housing Act, which is designed to relieve the mortgage problem. The F.H.A. is law.

Progress in banking is desirable,

Hors d'Oeuvres

• The amount of white turkey meat produced may be doubled within a few years. Turkey breeders are increasing the body depth and breastbone length of their birds. Now, if they would produce birds with four drumsticks!

• *During the first year of legal hard liquor, the people of these United States drank less coffee per capita by 16.3 cups. Probably because they had 16.3 fewer mornings-after headaches.*

• Cigarette ads recently featured a factory superintendent who gets a "lift" and a new interest in work from each smoke. The gentleman has the same name and face as a production executive with one of the big food companies. So now you know the secret of success in the food field.

• *Modernistic food packages, they tell us, will give way to those appealing to the appetite. Why not? Appreciation of food is more universal than appreciation of art, and twice as impelling.*

• *Milk containing Vitamin D concentrate has been introduced in Shanghai. Maybe the idea is to grow stronger-boned machine gun fodder for the Nipponese.*

• Talk about regimentation! British millers are under constant supervision of an autocratic committee which makes its word law by heavy fines. Each mill is given a definite quota. If a mill is uneconomic or unnecessary it is torn down. Contributions to this system have amounted to a million dollars on the part of the larger mills.

• *Soya flour is being used more and more in foods to add to their smoothness, taste and keeping qualities. Holland has a chocolate bar which is one-fourth soya. Should we say that it is "soya smooth"? Perhaps not.*

• Champagne is to be made from citrus fruit. So now the citrus industry will cater to man's instinct to improve his health in the morning and to his yearning to wreck it at night.

but not along the lines sponsored by the gentleman from Utah.

AAA Purge

IN 1933, a memo was carried around AAA which instructed administrative personnel that no code would be approved if it insured profits to manufacturers. Although this policy was never publicly stated, it explains why code committees wasted months and accomplished exactly nothing.

Jerome Frank, then counsel for AAA, has been credited with being its actual author, by the aid, consent or direct order of R. G. Tugwell. Mr. Frank has now been ousted and along with him went into oblivion many others of AAA, including Dr. Frederic C. Howe, of Consumers' Counsel, in a "purge" that took place on Feb. 5. Chester Davis, AAA Administrator, is now riding high.

For two ensuing days it looked like a shift to the right. The liberals and pinks of AAA were blue as indigo. They said . . . "Nothing can be accomplished by going as far to the left as the Administration has gone and then turning back . . . that the whole liberal program has gone to smash." Then Professor Tugwell came back from Florida, wept on the President's shoulder and was appointed to the new AAA operating council. What does it all mean?

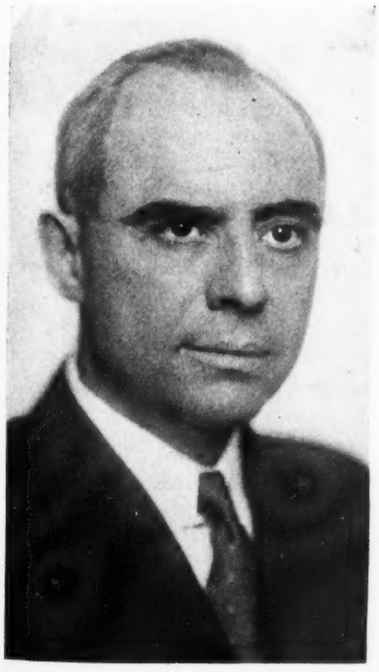
When the Peek crowd were ousted long ago, the right wingers were clipped off. Now the left wingers are gone. And Secretary Wallace seems to be pursuing his "planned middle course." Whether the recent "purge" is a clever move to lull food manufacturers by making them believe their friends are in power, thereby hoping to spike too much opposition to the extremely dangerous new AAA amendments remains to be seen.

Actually, however, it appears that the real answer is to be found in politics. The President is playing the middle of the road with an eye to 1936. He stands to lose more votes to Huey Long and Father Coughlin and similar extremists than he can afford to lose in the next election. His hope is now to hold the conservatives as well as the liberals.

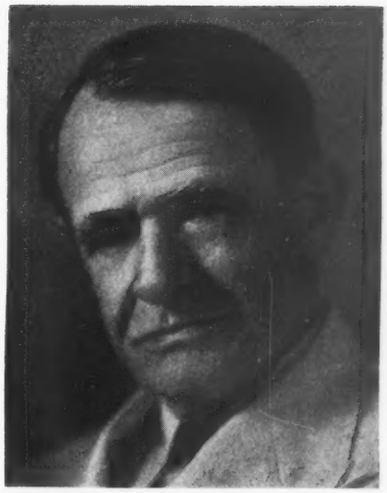
Practically, the "purge" means that AAA will try to get all the benefits possible for farmers under the existing economic system and not go after a theoretical ideal system.

We believe that business executives can now expect that arrangements for codes, marketing agreements and other projects involving AAA, will be carried through with business-like procedure into official action. Formerly they were often torpedoed or slyly pigeonholed by the now ousted left-wing lawyers when they did not like them.

Plainly the "purge" was a good thing for AAA, for the food industries, and for the entire nation. Let us hope that putting Tugwell on the governing board will not undo the long overdue cleanup, and that, as Frank Kent puts it, Tugwell is "dying on the vine."



CHESTER C. DAVIS
. . . riding high



FREDERIC C. HOWE
. . . hit the skids

Open Season on Oleo

IT IS "open season" on oleomargarine manufacturers. Congressmen from the dairy states have begun sniping with proposals ranging from outright prohibition more stringent than the Volstead law to sundry prohibitory tax and inspection measures. Representative Smith of Washington and Culkin of New York introduced the oleo prohibition bill. It would ban the manufacture, importation and sale of any butter substitutes manufactured wholly or in part from any fat other than that of milk. There is, however, plenty of possibility that this bill will be declared unconstitutional.

Not content with this masterpiece of proposed legislation, Representative Smith, together with Representative Withrow, Wisconsin, has drawn up another measure to provide an increase to 6c. a pound in the tax on uncolored margarine. This bill would also boost manufacturers' and distributors' taxes.

A move for stringent inspection and regulation of oleomargarine manufacture under the Meat Inspection Act has been made by Representative Pierce of Oregon. Tacked onto his bill is the provision for a tax of 10c. a pound on oleomargarine containing any foreign fats or oils. Still another proposed measure bars oleomargarine containing less than 75 per cent animal fat by weight.

Just to make the situation more complicated, Representative Knutson of Minnesota has framed a bill levying 7½c. a pound on the oil or fat contents of all edible products in which imported organic oils and fats are a constituent. The bill, however, skips cocoa butter, oleo on which a 10c. tax is paid and imported butterfat and cod-liver oil.

The oils and fats importers are not without a champion, however, Representative Dockweiler of California would repeal the existing excise tax against coconut oil. But let him try to do it!

Labeling Controversy Continued

ONE of the last public statements by the late Mrs. Rumsey, then chairman of the Consumers Advisory Board, ridiculed descriptive labeling. Her idea was that separate labels involving every conceivable permutation and combination of descriptive characters would be needed in every plant. Mr. Thomas Blaisdell, Jr., her spokesman, waved a package of more than a hundred descriptive labels which he

averred would be needed in a properly managed plant operating on sweet corn alone. By way of contrast he exhibited three ABC labels—all of the same brand, if our memory is correct.

Any manufacturer who knows anything at all about merchandising would never think of placing goods of varying degree of quality under the same brand label, but by implication the opponents of the descriptive system would violate the very foundation of present day merchandising methods. Irrespective of the system employed to convey information to the consumer, quite a number of labels will be required to do an adequate job and at the same time do justice to the manufacturer.

If descriptive labels are to be used it would appear to us that the bulk of the pack of well-operated plants would properly come under a standardized description which could be put on the labels in advance by the label printer. From 50 to 75 per cent of the labels could be ordered with but two or three different wordings. Our idea would be that roughly half or less of the manufacturers' labels should be printed with blank panels large enough for printing in the descriptive terms at the factory when shipping out the goods. Presumably not many of the latter type of labels would be utilized with top quality products. An automatic feed multigraphing machine could do the fill-in job at small cost.

The conclusion is inescapable, however, that if descriptive labeling is widely and constantly used it will be a compelling force toward better technical and quality control. Workmanship will need to be standardized and improved in many a plant.

Rope

ONE of the most widespread of so-called industrial disease is "rope." Hardly a food industry exists where water is found somewhere in the manufacturing process that does not suffer occasional attacks of this affliction. From the viewpoint of the laboratory bacteriologist, rope is very simple: it is only the development of a type of bacteria that exhibits encapsulation when conditions are favorable to its development.

Sounds simple, doesn't it? Just like the medico who tells his patient that he has a hydronephroma. (Mankind loves to dignify its troubles by using big words for little ones). Encapsulation means the development of a slimy capsule, or layer, around each bacterial cell.

So much for the name of the trouble. By whatever name you call it, it is still rope to the man in the factory.

Our purpose in commenting on the subject here is to call attention to the fact that F. W. Fabian and A. L. Nienhuis, of Michigan Agricultural Experiment Station, East Lansing, Mich., have made a noteworthy study of rope in brine pickles. This bulletin should be in the hands of every pickle man who has even a smattering of scientific training. And those who have the job of studying ropiness in other industries would also do well to read it carefully.

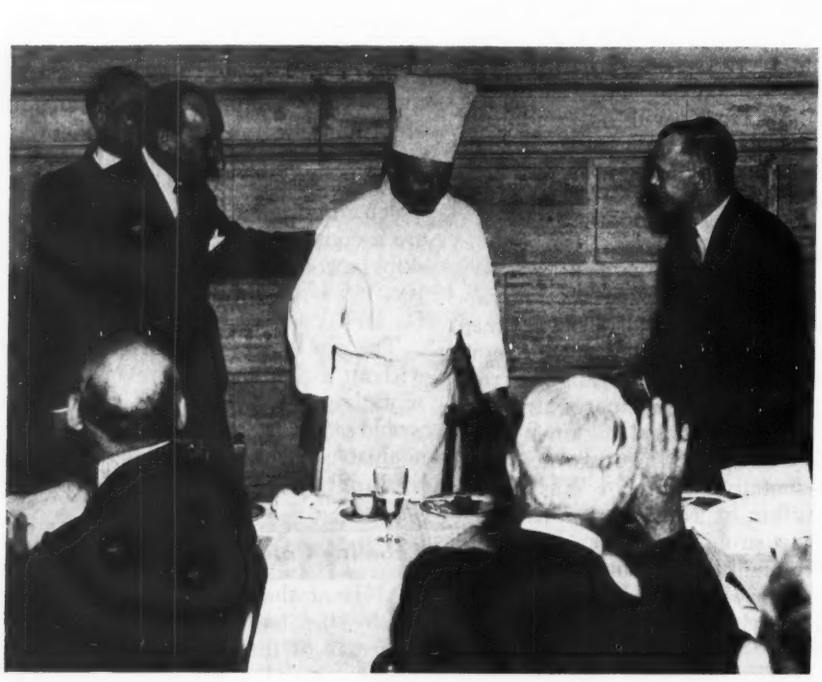
They give some very practical ways to combat rope. The most interesting feature of it to us is that they give the scientific reasons for the common method of curing these troubles previously worked out by practical pickle salters through trial and error, such as taking off the ropy brine and replacing it with fresh brine, or by "socking" on the salt.

They find however, that the rope bacteria grows better at higher than at lower temperatures—something that many a pickle salter will wonder about. The belief is fairly widespread that rope is a condition which can develop quite rapidly in a pickle tank by the mere act of chilling the tank, as by allowing cold air to blow into the tank room in the winter time. However, rope is very difficult to study by reason of the fact that one must find his ropy pickles when he can find them.

But for the benefit of that minute group of readers of FOOD INDUSTRIES who relish the morbid suggestion that rope is an industrial disease, let it be emphasized that rope is a bacterial affliction of a factory, not a disease of cats, dogs or human beings; and that all organisms causing ropiness are innocuous, although very annoying in industry.

Homogenizing

HOMOGENIZING is much more than merely pumping a liquid through a homogenizer. Even with the best machine made, the maintenance and adjustment of valves must be right or a poor job will result. Ice cream makers using continuous freezers have discovered that poorly homogenized mixes will deposit frozen butter inside the barrel. And after that—no go.



THEOPHILE KIEFFER

Chef of the Sherry-Netherland Hotel, takes a bow. His reputation is that of the best sea food chef in New York. The occasion was the eight course inaugural sea food luncheon on Feb. 5, of the Fish and Sea Food Institute. This organization is to promote the consumption of sea foods during the impending period of high priced meats. Left to right: J. O. Volt, managing director of the Sherry-Netherland, Chief Theophile, and Harden F. Taylor, president, Atlantic Coast Fisheries Co., chairman of the meeting. "There are no droughts at sea."

MEN *in the news . . .*

E. A. Cudahy, Jr., has been reelected president of Cudahy Packing Co.

• JEAN N. BISTLINE recently was made vice-president of Nestlé's Milk Products, Inc., Los Angeles.

• R. BROTHERTON, Commander Larabee Corp., is the new chairman of the Buffalo section of Association of Operative Millers.

• E. L. CORN has been elected president of Southeastern Millers' Association.

• JOHN L. DEASON again heads up Fletcher Coffee & Spice Co., Little Rock, Ark.

• I. J. DEVORE has been elected president of Gateway Baking Co., Fort Smith, Ark.

• WILLIAM F. DUBOIS has been made vice-president and general manager of N. Auth Provision Co., Washington, D. C.

• DWIGHT K. GRADY, San Francisco, heads up the new California Fig Institute.

• L. J. GRAHAM AND F. E. JAMES of the department of agricultural and biological chemistry, Pennsylvania State College, have accepted research positions with G. W. Curnrick Co., Newark, N. J., and Ralston Purina Co., St. Louis, respectively.

Martin L. Schmidt, president of Coca-Cola Bottling Co., Louisville, again heads Kentucky State Bottlers' Association.

• DR. J. R. HALL is with Warner Jenkinson Co., St. Louis, in charge of manufacturing in the extract and beverage departments. He formerly held an A.B.C.B. scholarship at Iowa State College.

• H. CHRIS HANSEN, Lansing, recently was elected president of the creamery division of Michigan Allied Dairy Association. J. NEAL LAMOREAUX, Comstock Park, was chosen president of Michigan Milk Dealers' Association.

• JAKE HOERHAMMER is the new president of Indiana Bakers' Association.

• RAY IVERSON has become general purchasing manager for Nutrine Co., succeeding Max Sobel, resigned.

• RAY JOHANNING recently was appointed manager of the Green Bay (Wis.) plant of Kraft-Phenix Cheese Corp.

• H. H. JOHNS, Dallas, is now president of Texas Ice Cream Manufacturers' Association.

• EDGAR M. LUKE has been appointed general manager of Armour & Co.'s Spokane plant.

• D. W. MCMILLEN, former president of Allied Mills, Inc., who has been operating Central Sugar Co. and Central Soya Co., Decatur, Ind., has established McMillen Feed Mills, Inc., Fort Wayne, Ind.

• A. H. MINOR, formerly chief chemist for Patterson Laboratories, Hutchinson, Kan., now is with M. Saur Milling Co., Cherryvale, Kan.

• EDWIN C. MUHLY has been elected president of Potomac States Bakers' Association.

• L. H. PATTEN, JR., recently chemist with Atkinson Milling Co., Minneapolis, has joined Wallace & Tiernan Co., Inc., Newark.

• JAMES H. POST has been moved from the presidency of National Sugar Refining Co., New York, to chairman of the board. Charles D. Bruyn, former vice-president, now is president.

• FRANK PUTT, who recently resigned as president of Brandle & Smith, Philadelphia, now is president of the newly formed Sugar Products Co., Newark, N. J.

• CHARLES V. RAINWATER recently resigned as president of Coca-Cola Bottling Sales Co., Atlanta, and as vice-president of the manufacturing company.

• SAMUEL H. RAY has been made general superintendent of Bonomo Candy & Nut Corp., Brooklyn, N. Y. He leaves Overland Candy Co.

• STANLEY M. ROSS, president of Borden's Dairy & Ice Cream Co., Columbus, Ohio, now heads up fluid-milk and ice-cream operations of Borden's new Middle-West division.

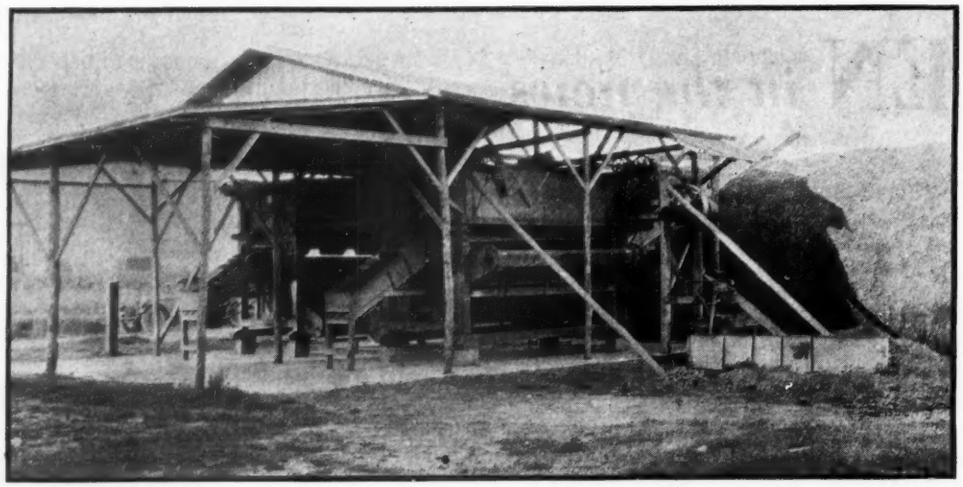
• FRED N. ROWE, Portland, recently was elected president of Michigan State Millers' Association.

• JOHN R. SOUSA, Oakland, has been made president of California Association of Carbonated Beverage Manufacturers.

• R. S. TATE, Pittsburgh manager for Libby, McNeill & Libby, has been appointed assistant to F. B. Childs, vice-president at Chicago.

• GEORGE H. WILLIAMSON has been asked by NRA to resign from the confectionery code authority.

• GEORGE N. GRAF and Harry P. Schaefer of Quality Bakers of America, have formed Graf-Schaefer Services, Inc., New York. The firm will offer merchandising, sales and advertising service to bakers.



A viner station. The interval between threshing the peas from the vines and blanching them in a factory several miles away is a period of constantly deteriorating quality. The quick freezers discovered it in 1930. Canners have known it too. What can be done about it?

Avoid the Danger Period

By L. V. BURTON
Editor of FOOD INDUSTRIES

EXPERIMENTS should be made in 1935 toward getting the raw material into the canning factory in fresher condition. Corn and peas offer a splendid opportunity for improvement.

Vegetable canners can profitably borrow from the experience of the Southern winter vegetable shippers, who have been very liberal with crushed ice in the last few years, having learned how to maintain the original quality of vegetables by low temperatures.

Bruises received by peas while passing through the viner stimulate enzyme action which results in the development of an unpleasant flavor.

Producers of frozen peas by the quick-freezing process discovered in 1930 that bruised peas developed dark spots when held in freezer storage a few months. They had to lick the problem or get out of business. They first tried to find a non-bruising method of pea-shelling, but it proved to be very expensive. One plant even tried shelling by hand 600 tons of peas in the pod! The next step, predicated upon prior researches by the National Canners' Association, was to blanch the peas. The purpose here was to inactivate the enzymes by heat. But to secure the maximum of benefit it was necessary to sharply reduce the time elapsing between vining and blanching.

Avoiding the danger period by this method is possible in canneries only where viner stations are very close to the plant. Where viner stations are from 1 to 50 miles away something else must be done.

A POSSIBLE solution is to mix crushed ice with shelled peas in the field boxes as fast as the shelled peas roll out of the viner. Chilling the peas will reduce the amount of enzymatic activity set up by the bruising, as well as slow down the other life processes in the peas, thus contributing materially to better quality after canning.

Enzymic damage to flavor has been brought to the attention of the industry by publications from the research laboratory of the Association but only a few canners have investigated the suggested remedies. If the fresh vegetable shippers can afford to use ice and thereby command premium prices for their products in the very season of the year when the biggest sale of canned vegetables should occur, it would appear that canners cannot afford to miss the opportunity to test what it can do for them.

Natural ice can be used if available. Artificial ice costs about $5 or $6 per ton wholesale. A machine for making flake ice will have an initial cost of about $1,000 per ton capacity of flake ice per day.

Assume that the peas have an initial temperature of 75 deg. F. and must be cooled to 35 deg. F. The specific heat is 0.84. Heat to be removed is about 3,360 B.t.u. per 100 lb. This theoretical heat removal means melting 23.3 lb. of ice. On a practical basis, the amount of crushed ice probably needed would be about 30 to 40 lb. per 100 lb. of peas. Based on a $5 wholesale price of ice, this would mean a cost of about 10 cents per 100 lb. of peas, or about 1 cent per dozen No. 2 cans.

HERE are a few of the questions that should be answered by the tests:

What benefit will be gained for the extra cost?

Will the benefits return the cost plus a profit?

How much should the peas be chilled?

Is a higher temperature, such as 50 deg. F., cold enough?

Is the suggested amount of ice more than enough, or is it too little?

Is chilling necessary all day, or even every day?

Can any unmelted ice be salvaged?

Will ice in the peas interfere with cleaning and fanning operations?

Those who desire to pursue the investigation should study the publications of the Research Laboratories of the National Canners Association by the following investigators:

P. L. Gowan, 1928; H. R. Smith, 1930; E. F. Kohman; convention issues of canning publications; E. F. Kohman and N. H. Sanborn, *Ind. and Eng. Chem.*, 26, 773, 1934.

FIVE YEARS OF PROGRESS IN

Materials for Packaging

AN EDITORIAL

TO THE production executive—the man who must make the decisions on what manner of package shall be used for a food, or what it shall be made from, a package is much more than merely an attractive object.

All the beauty and customer-appeal that it is possible to design into a container or to print on a label is something to be proud of only if and when the product is properly protected from the hazards of commerce. Even then, the production executive is not satisfied until the cost of correct packaging is small enough to permit profitable operation of his plant.

To the experienced factory man, those intimate details of a package which escape the attention of even hypercritical sales executives, are of much greater importance than balance of color masses or modernism of design. Though these factors of eye appeal are essential for making the first sale of the product, the man in charge of the plant knows from experience that only a perfect product, perfectly protected, will bring a customer back for a second purchase.

FOR the first sale, the full credit goes to the sales department. But for the second sale, and all the sales thereafter, most of the responsibility falls upon the boys in the plant who seldom if ever see a customer. If the plant force falls down, if the product or the protection of the product is not right, the shouts of disapproval will be audible, even out on the shipping dock, yea even into the laboratory and the receiving office.

So often it is the little things that go to make a good packaging job. Trifles that go to make the second sale, but which none but the production executive could create. Yes, trifles! Trifles like the overlap on the sealing ends of a waxed paper wrapper to keep out moisture. Trifles like the waterproof waxed paper backing of the cork liner of a bottle closure to prevent corrosion. These are the sort of features of packaging that count in doing a good production job.

For that reason this review of progress in packaging materials, the first since our review of the field in 1930, is devoted largely to the utilitarian aspect of packaging. As an expression of decorative or merchandising art, packaging has, of course, a very definite relationship to these sales adjuncts. But all art, to be successful, must perforce be a superimposed treatment of sound underlying utility values.

It is these values beneath the surface that interest us most in this issue. In the next seventeen pages will be summarized the significant developments that have occurred since 1930 in the following fields:

Foils, collapsible tubes, glass containers, steel containers, closures, wrappings, paper cups, bottles and cans, and tin cans.

IN APRIL the series will be concluded with further discussions of progress in the field of plastics, bags, cartons, shipping containers and adhesives. Likewise there will be a place for any significant omissions from the current presentation.

Lest anyone be startled at the brevity of these reviews, let it be recalled that these are not reviews of all that is known about packaging materials. They are reviews of what has developed in the way of new materials for packaging or new uses of familiar materials in the last five years as far as we have been able to acquire the information from our own contact with the materials, from what the users of them have passed along to us, and from what 692 manufacturers themselves have been persuaded to say for their *new products*. If you want the dope on who makes what, and cannot find it here, write us. Some of the information we wanted for this survey may reach us too late to meet the deadline.

Metal Foils

FROM an inconspicuous "spot" as a liner in a crown seal to a highly decorative, ultra-styled outer wrapper for high-priced confections, foil is being widely adopted as a protective packaging material throughout the food industries.

With their excellent qualities of: (1) decoration, (2) ease of application, (3) adjustability to irregular surfaces, (4) prevention of moisture transfer, (5) imperviousness to light penetration, (6) protection against insect infestation, and (7) oil and grease resistance, they are used both as straight or plain foil and as paper or cardboard-backed foil in either plain, hammered, embossed, printed, or lacquered surfaces.

Excepting the hammered and lacquered finishes there is virtually nothing new in foils since 1930, as most of the progress in foil packaging has been in regard to new applications instead of new foils themselves.

Although many of the protective characteristics had been determined previously, widespread recognition of these qualities has been within the past five years. In this period aluminum foil has largely replaced tin, composition, and lead foils for most packaging purposes. The reasons are partly economic and partly technological.

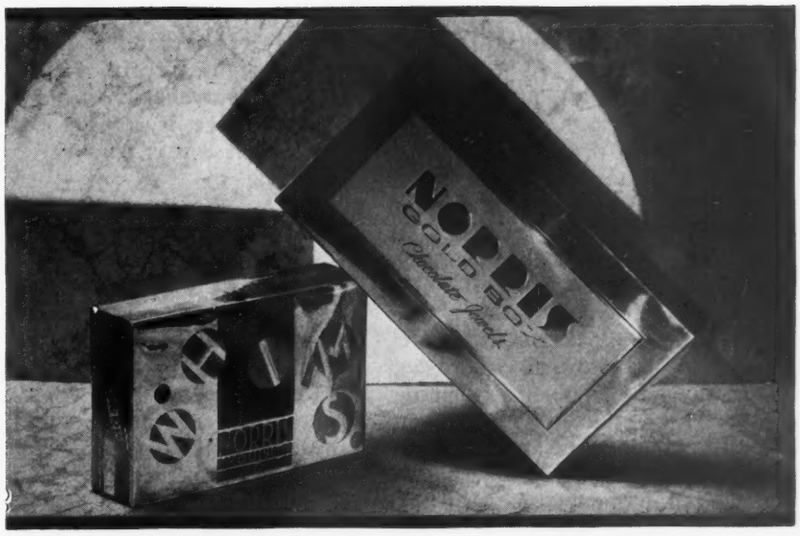
In addition to its greater coverage per pound,[1] aluminum is capable of being polished to a mirror-like finish and lends itself particularly well to color printing. This enhanced decorative appearance has also been made possible by the development of better lacquers and of more brilliant and quicker drying inks.

[1] FOOD INDUSTRIES, January 1930. p. 22.

How Foil Is Used

Use	Gage	Adhesive	Backing
Beer bottle cap spots	.0022	If paper backed—colorless cement	Paper backed or no backing
Bon-Bon cups	.002	None	No backing.
Bottle neck wrappers	.0004 to .00065	If paper backed—colorless cement	Paper backed or no backing
Box covers, packaged goods	.00035 to .0005	If paper backed—colorless cement	Plain or paper backed
Butter	.0005 to .001	If paper backed—colorless cement	Glassine paper backed or no backing
Cakes	.0005	Wax	Waxed paper
Candy bars	.00035 or .00045	Wax	Waxed paper
Candy mints	.00065 or .0007	None	No backing
Cheese jar tops	.002	None	None
Cheese wrappers	.0005	Wax	Various weight paper
Cheese wrappers	Up to .0008	None	No backing
Chewing gum	.00035	Wax	16 lb. Wax paper
Chocolate bud wrapping	.0004 or .00045	None	No backing
Chocolate covered centers	.0004 to .0005	None	No paper, or tissue interleafed
Chocolate nut clusters	.00035 or .00045	Wax	16 lb. wax paper
Coffee	.00035 .00045 .00065	Glue lines or solid colorless cement	Paper
Cream and milk bottle caps	.0035	None	None
Dried fruit	.0005	If paper backed—colorless cement or glue line	Paper backed or no backing
Frozen food packages	.0005 to .00065	Colorless cement	Book paper
Ice cream bars	.00035	Wax	16 lb. Wax paper
Meat wrappers	.0005	Wax	Paper
Tea	.001 to .0015	None	No backing
Tea	.00035	Glue lines	25 lb. paper
Tea	.001	Colorless cement	Paper
Yeast	.0005	None	No backing

Their Protective Qualities Are More Fully Recognized and Utilized



Development work by such companies as Reynolds Metals Corp., New York, N. Y., and Aluminum Co. of America, Pittsburgh, Pa., has produced what is known as self-sealing foil wrappers; paper-backed foil for bottle neck wrappers, box covers, potato chip bags, gum, candy, butter and meat wrappers, and general purpose bags; special coated foil for cheese; foil-lined cartons for such foods as dried fruit, tea, and coffee; and laminated bags for coffee.

Self-sealing foil wrappers are coated with wax and can be sealed by the momentary application of heat after being wrapped around a package.

Paper-backed foil for box covers has been perfected to the stage where both set-up and folding box manufacturers can use foil as easily as fancy papers on other types of box coverings. In some instances the foil is backed with label paper so that the foil can be next to the box or carton for protective purposes and the paper used as a printed label or wrap.[2] Cardboard-backed foil makes foil-lined cartons practical.

Butter wrappers are still in the experimental stage, but they have shown considerable promise. A number of dairies have already adopted them. As foil is impervious to the passage of light and moisture, the butter keeps fresher over longer periods of time.

Cheese wrappers make possible individually-wrapped portions of cheese which are protected prior to sale and which reach the consumer as a fresher, tastier product. Possible reaction between the cheese and the foil is avoided by a special coating given the foil that in no way affects the properties of the cheese. One of the chief objections to this method of packaging cheese is thus eliminated.

Several coffee manufacturers are packing coffee in special bags in which aluminum foil is used either as an inside liner or as an intermediate layer in the bag itself. This method of packaging saves weight in the package and is effective in retarding the passage of heat and moisture. Such use for aluminum foil may also be considered in a development stage.

In foil-lined cartons for dried fruit the foil is solidly attached to the carton and provides protection from moisture transfer.

Foil wrappers for meat are likewise comparatively new. Foil is being used for ham; fully mounted to paper backing.

WHILE the development of new types of packages can be said to have had a marked influence on the wider use of foil during the past five years, it is the better understanding of its protective qualities that is the more fundamental reason for its increased adoption.

A noteworthy example is the foil-protected package for prunes,[3] which has made possible the marketing of a soft, tender, easy-to-prepare prune. The package consists of a paper-lined metal foil tight-wrapped around an ordinary paper carton. The wrapper is so effective in preventing moisture loss that the prune packers have been able to make use of a new process of treating prunes. These packers rely upon the new package to deliver the prunes to the consumer with the same quality they have on leaving the factory production department.

Another recent development is the package for a well-known brand of tea to replace a canister.[4] Absorption of moisture is one of the primary causes for the deterioration of tea, and it is important that the package be highly resistant to moisture transfer. Tests proved that the metal foil package allowed only 2 per cent moisture absorption, against 16.8 per cent to 8.5 per cent for other packages. Tea deteriorates rapidly when the moisture content passes 6 per cent.

Resistance of foil packaged foods to insect infestation led one large concern to package a ready-mixed cake flour in foil bags, even though the product is placed inside a slip-cover tin container.[4]

Protection of products sensitive to the action of radiant heat is the most recently recognized quality of bright foils. Even though some convincing results have been obtained from studies on this quality and some commercial adaptations of this protective quality have been made, additional studies are in progress.

When Wayne R. Coe, Bureau of Chemistry, U.S. Department of Agriculture, recently discovered that light is probably the primary cause of rancidity in foods containing oils and fats, and that containers made from foil were effective means of preventing spoilage, the potato chip and salted peanut industries came to realize the necessity of placing their products in light-proof packages. This led to the manufacture of foil bags that not only possess all the pro-

[2] FOOD INDUSTRIES, February 1935, p. 79.

[3] FOOD INDUSTRIES, December 1934, p. 552.

[4] FOOD INDUSTRIES, October 1934, p. 457.

tective properties of foil, but in addition have a bright, sanitary appearance.

Peanut brittle, meat products, coffee, coconut, crackers and dates are a few of the food products that scientific packaging tests have shown can be kept in better condition by foil packaging.

When viewed from the decorative angle the attractive feature of foil is that it is readily available in a wide variety of colors, patterns and prints. For example, it is used either plain or decorated by embossing, printing, or lacquering. Often two or more decorative treatments are combined, such as embossing and lacquering.

Plain foil, less expensive than decorated, is used in places where there would be no particular advantage in a decorative scheme. Examples are seen in containers for tea, and wrappers for chewing gum and some kinds of candy.

Attractive patterns on foil are often secured through embossing, which is merely the process of impressing the foil with a design engraved on steel embossing rolls. Interesting effects, ranging from ornate, flowery design to the straight, forceful lines of modern art are available. Sometimes a more effective background for the printed message is obtained through embossing.

THE use of clear or tinted lacquers on aluminum foil gives a highly lustrous, metallic effect to the surface that is exceptionally well-fitted for some purposes. Lacquering is accomplished by running the strips of foil through rolls to apply a thin film of quick drying lacquer to the surface. Mottled effects are obtained by ingenious methods of spray.

Sometimes it is advisable to incorporate the printed message and the name of the product on the foil wrapper and thus eliminate an outside wrapper. Printing over an aluminum foil surface presents no particular difficulties, provided certain precautions are observed.

When large areas are to be printed, plain foil is the best. Where fine line design is employed in the printing, embossed foil is recommended, except in cases where the embossed patterns are so pronounced that they tend to blend with the printing and confuse the reader. Better results will be obtained in all cases when concentrated inks are used.

Backings when used are to give the foil additional strength. Waxed paper, cement and glued paper are generally used for this purpose. Waxed paper adds strength and, in a measure, prevents scuffing. Paper with both sides waxed is sometimes applied to the foil, for example, when used as a wrapper for sticky candies. Foil attached to glassine paper by colorless cement is for butter, with the glassine paper on the outside and the foil next to the butter.

The cement adhesive gives a tight firm bond between the paper and the foil, and can be supplied either water-soluble or not water-soluble. This type of wrapper is extensively used for lining and wrapping boxes where moisture resistance is an important consideration, also for folders, greeting cards and labels for glassware.

Collapsible Tubes

PACKAGING tests in collapsible tubes have been made with chocolate sauce or paste, honey, cake icing, fruit jam, cream cheese, sandwich spreads, condensed milk, catsup, peanut butter, lard, fish pastes, beef extract, prepared mustard, coffee concentrate, and food colors and flavors.

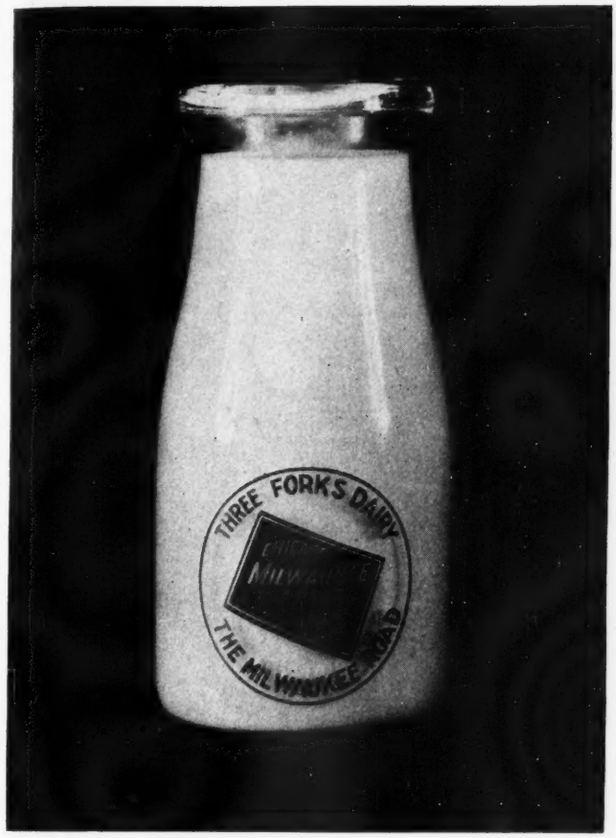
Even though most of these tests have given favorable results and some have been expanded to a commercial market basis, both the American food manufacturer and consumer are slow to accept collapsible-tube packaging for foods. Some of this hesitancy is undoubtedly psychological, some economic, and some has a technical basis.

The cost of tinplate cans for lard and condensed milk, and glass jars and bottles for other products has declined so much in recent years that these containers prove less costly than collapsible tubes made almost exclusively for foods from tin and aluminum. Because of the corrosive action of some of the foods, tin, the more costly of the two metals, must be used. Efforts are being made to cut this cost by the use of tin-lined lead tubes.

Another technical problem in connection with packaging in collapsible tubes is leakage at the closure. Attempts to solve this problem have been made by the use of adhesives in combination with improved methods of crimping and making multiple folds of the tube shell at the closure. Clip closures appear to permit both "breathing" with temperature changes and leaking, especially when oils are present. A recent development in closures by the F. J. Stokes Machine Co., Philadelphia, Pa., appears to have solved that objection to collapsible tube packaging.

There has been some difficulty in making certain that collapsible tubes are fully sterilized before being filled. That objection, however, arises more from the technic of carrying out sterilization operations than from the use of collapsible tubes.

Arguments in favor of collapsible tube packaging are: (1) complete isolation of the product from the effect of light and air—thus preventing rancidity of oil-bearing foods, drying-out of moisture-bearing products, and keeping the contents free from microbiologic and dust contamination; (2) less need for refrigeration of unused portions of a package; (3) convenience with which unused portion of contents of container can be kept in pantry; and (4) the ready availability of the contents of the package when wanted as only the amount desired for immediate consumption is removed from the container. In the case of the coffee concentrate portions for individual servings are packaged in individual collapsible tin container.



Stealing of returnable empties and bootlegging of inferior quality products in refillable containers are greatly discouraged by easily seen and identified permanent markings on the glass containers.

Glass Packaging

Reuse Containers, Vacuum Packing, Mark Trend

DESIGN for vacuum packing and for reuse value has come to characterize glass containers during the past five years. Often both features are incorporated in the same package.

Glass containers also reflect in their designs the wide adoption of mechanical refrigeration in the home and the legalization of alcoholic beverages, especially beer.

Desire by the housewife to obtain suitable receptacles for meal left-overs and for water or other beverage cooling make such containers popular until her needs are supplied. It is a smart food manufacturer who shifts at the right time to another type of reuse container which will help keep up his sales volume. Glass beer mugs for a while at least were in demand by manufacturers of such foods as pickled meats, which are considered companion foods to the consumption of beer. However, the most popular reuse container is the crystal clear thin-blown tumbler produced by such companies as Libby Glass Manufacturing Co,, Toledo, Ohio; Federal Glass Co., Columbus, Ohio; and Hazel-Atlas Glass Co., Wheeling, W. Va. So popular are these containers that one tumbler manufacturer has supplied 75 carloads to one Pacific coast cottage cheese maker during 1933 and 34.

These tumblers are not new in themselves nor is the adoption of reuse glass containers new. But until less than four years ago jelly glasses and jam jars were the principal reuse glass containers adopted for packaging dried beef, peanut butter, mustard, cottage cheese, jam, jelly and preserves, now packed in these thin-blown table tumblers. Even tea, olives, fruit juices, mayonnaise and salad dressings have been added to the list of foods packed in these tumblers.

The 12-oz. iced tea tumbler is considered standard for the 1-lb. preserve package; the 8-oz. beverage tumbler for cottage cheese, cheese spreads, mayonnaise, and salad dressings; and the 5-oz. orange juice, the 6-oz. root beer, the 9-oz. water and the 12-oz. iced tea tumblers for dried beef.

To a very great extent these tumblers are of the plain glass design and, at least in the case of the Libby Glass Manufacturing Co., are guaranteed not to chip. However some food manufacturers, such as the Williamson Candy Co., for its Princess Pat peanut butter and Kraft-Phenix Cheese Corp. for its cheese spreads use the decorated tumbler.

So satisfactorily do these tumblers handle on the production line that out of 31,000 put through a cheese plant

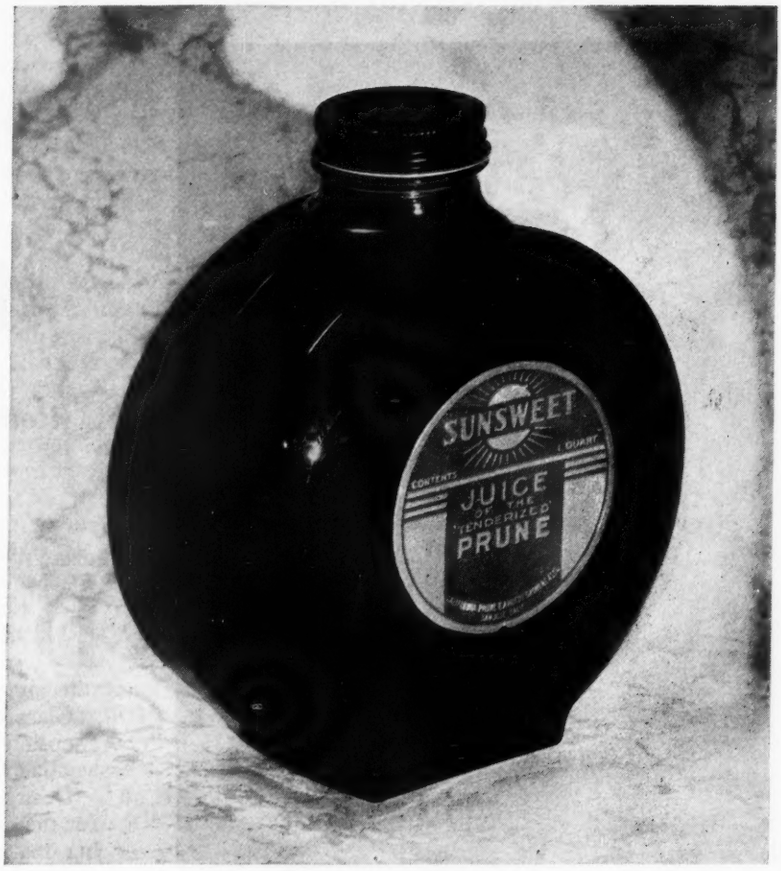
on an 8-hour run only 155 failed; 120 of these failures were due to slight irregularities in the finish of the tumblers.

Other reuse glass containers that have come into prominent use in the past few years are the vacuum-pack coffee jars, ground spice containers, and fruit juice bottles of the Owens-Illinois Glass Co., Toledo, Ohio and the de luxe all-glass containers of the Vacuum Jar Corp., New York, N. Y.

The coffee jars are designed both for pantry use and for home canning; the spice containers have shaker tops for condiments; the one-quart fruit juice bottles are for pantry and refrigerator use; and the de luxe jar is adaptable for a dressing table or smoking stand receptacle.

OTHER containers such as olive oil bottles, one-gallon vinegar jugs, and tomato juice bottles respectively have reuse value as rosebud vases, flower vases, electric-light bases, and cocktail shakers.

Table jars for mustard, sandwich spreads and peanut butter have been gaining in popularity. As the table-jar term indicates, these containers are attractive



Pleasing in color and attractive in design the dark green water bottle stimulates sales of Sunsweet prune juice.

Reuse value of container as a beverage tumbler or table service dish has increased sales of products from 100 to 1,000 per cent.

to the container. Anyone attempting to use an anigraphed container runs a double risk of being detected and prosecuted as anyone other than to whom sold having such containers in his possession would be open to suspicion. This process is under the control of the American Anigraphic Corp., 202 East 44th St., New York, N. Y.

HAND in hand with these developments in glass packages has been the progress in closures and labels. In fact, vacuum packing is directly dependent for success upon the adoption of a carefully designed closure and it was not until the closure problem had been solved that thin blown tumblers became feasible for food packaging. Some of the reuse containers are practical on the factory production line only because the type of closure selected permits labelling on its surfaces. Such labelling is accomplished by the use of printed or lithographed seals.

Knife used as lever in slot of closure gives easy opening and tight closing of reuse coffee jar. It is vacuum packed.

in design and of table service capacity so that they can be used as a part of the table setting, thereby making special table service containers unnecessary.

Methods for applying identifying marks or decorative patterns to glass containers have been developed by at least two companies. Fusing or "pyroglazing" firm names, trade marks, and other identifying symbols or slogans into returnable containers such as milk bottles was demonstrated by Thatcher Manufacturing Co., Elmira, N. Y. in 1932. These markings are not diminished in brilliance or distinctiveness by washing, exposure to sun, wind, or frost, or rubbing of bottles against each other. They are obtainable in a variety of bright colors such as blue, green, orange, red. In addition to lending attractiveness to the bottles especially when filled with milk or cream they make "pirating" of empty bottles more detectable and for that reason are becoming widely used by leading milk distributors.

The second method is by anigraphing, which may be likened to lithographing or printing in that any pattern or design that can be transferred to paper can be transferred to glass. The imprint is resistant to ordinary solvents, to washing and cleaning operations, and to ordinary shelf and storage conditions.

Anigraphing, like pyroglazing, gives a protective as well as a decorative identity

Pyroglazed advertisements on milk bottles can be used to stimulate sales in family products.

Steel Containers

New Protective Linings Increase Utility

PROTECTIVE linings seconded by special corrosion-resisting metals have boosted steel barrels, drums, kegs, buckets and cans into desirable containers for foods.

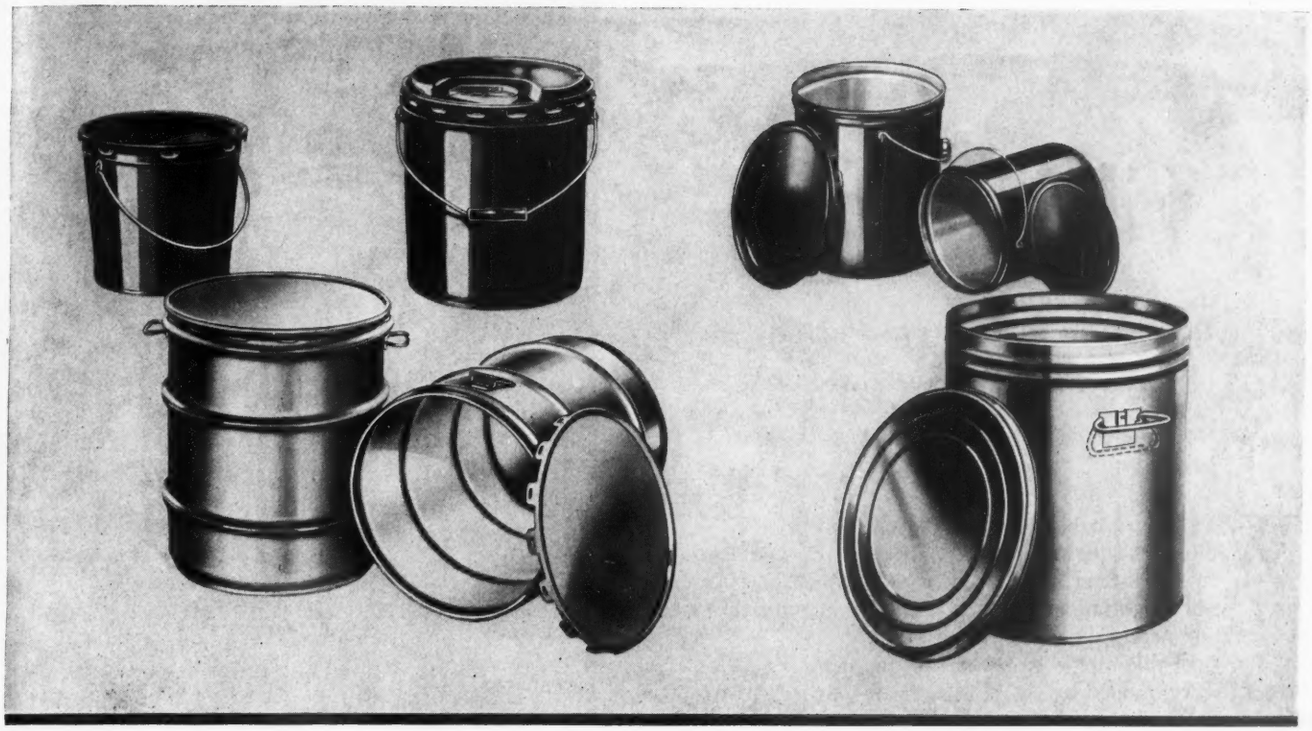
As recently as the late '20s comparatively few daring manufacturers of food materials cared to encourage skepticism in the minds of users of their products by shipping in steel containers, even though such containers had been widely used by non-food industries for several years. Among these pioneers were manufacturers of corn syrup, edible fats, dry malt and skim milk powder, sold primarily in barrel lots. Even these manufacturers were sensitive to criticism and invariably made the container the scapegoat for any inferiority in the quality of their products so shipped. In the case of dry malt and skim milk powder lightweight, single-trip drums were used with kraft paper safety bag inner liners and solid edible fats were ofttimes protected from contact with the metal by use of parchment paper liners.

With the adoption of easily removable heads and in the early '30s, of enamel-like protective sanitary coatings which are baked on the inner surfaces of the containers by passage through baking chambers at temperatures as high as 350 to 500 deg. F., there has come a wider recognition of the practicability of steel barrels, drums, kegs, cans, and buckets as general shipping containers for foods. Also the use of stainless steel, stainless-clad steel, heavily tinned and galvanized steels and aluminum in the construction of these containers has contributed to their greater use in the food industries. Cost, resistance to rough handling, and type of products to be shipped in them influence decision as to their use in all cases.

The protective coatings are neutral in taste, odor, and chemical reaction with the contained foods and can be varied in composition to meet the specific characteristics of the foods packed in the container. One of the earlier types of coatings used contained rubber as an ingredient. Contrasted to this are quite recent developments in protective linings which show promise of a porcelain-like coating whose appearance conveys the conviction of cleanliness and sanitation. For use in the brewing industry, metal kegs are lined with brewer's pitch or aluminum. Between these extremes is a range of selected linings which give the best performance for the product to be packed in the containers. An important precaution for a food manufacturer to take is to acquaint the manufacturer of the steel container fully with the product to be packed in the container, the probable length of time it will be in the container, the conditions under which it is likely to be stored, handled and shipped, and the conditions under which and the means by which the contents will be emptied from the containers. With this information in the hands of his technical or research department the container manufacturer can specify the style of container and the type of protective coating that should be supplied.

PIONEERS in the development of these protectively-lined steel containers are: National Steel Barrel Co., Cleveland, Ohio; Pressed Steel Tank Co., Milwaukee, Wis., and Wilson & Bennett Manufacturing Co., Chicago, Ill.

From a very modest beginning in the 1920's steel containers are now available in the styles and capacities



listed in the table, which represent those manufactured by Wilson & Bennett Manufacturing Co. Other manufacturers have many, if not all, of these different types and capacity containers. They may be fabricated from stainless steel, stainless-clad steel as well as from standard steel plate or tinned and galvanized steel, lined with protective coatings, and in most instances lithographed on the exterior, according to the wishes of the purchaser. Quite recently the trend has been toward the lighter gage containers, whose tare weights are comparable in freight expense to containers of other construction. When shipping distances are other than local the heavier returnable containers are not as economical to use as the lighter ones, which can be sold to second-hand dealers or re-used by the purchaser for bulk shipments of his products.

Half-barrel or 15½-gal. beer kegs are obtainable in single- and double-walled steel (insulated and non-insulated) construction or in aluminum. Except in the case of aluminum, the lining of the kegs may be stainless steel, brewers' pitch or protective enamels. Lightness in weight (21 lb.) and the lack of need for an inner coating are the reasons given for using the aluminum keg. Those of steel construction are either of pressed or welded fabrication and with or without bilged sides.

Open-top barrels for general food use are also of pressed or welded fabrication generally with bilged sides and sealing ring, resilient gasket closures held in place by locking levers or adjustable bolts. Also, the barrels and drums may be equipped with agitators which help to keep solids in pastes or concentrates in suspension.

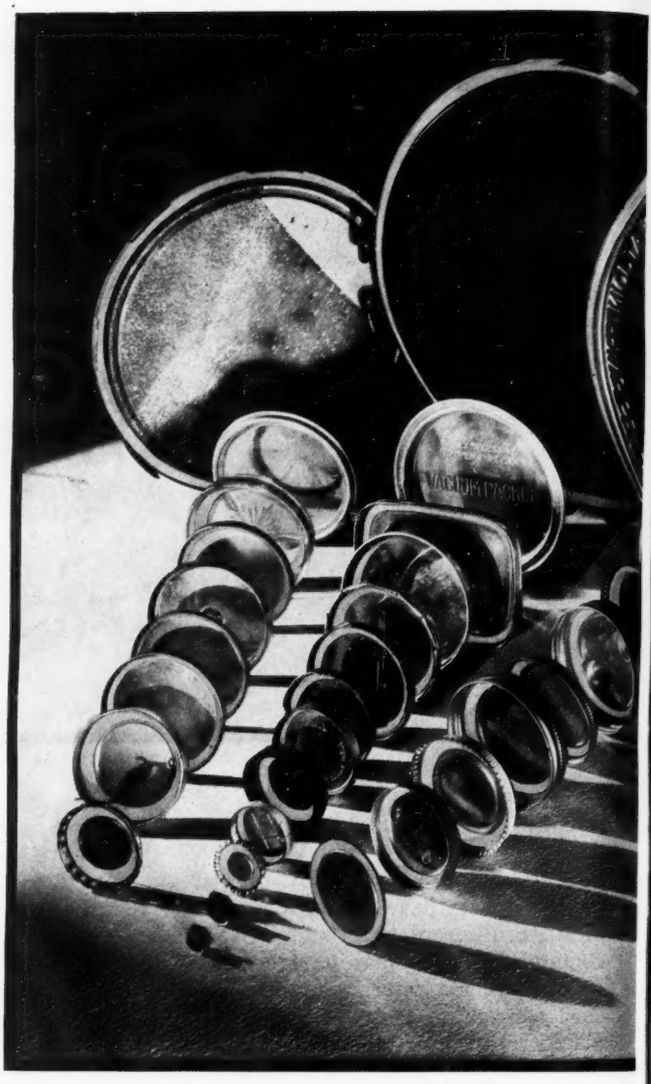
SOME of the foods and materials used in food manufacture now shipped in steel containers are: beverage flavoring syrups, butter coloring, chocolate and cocoa syrups and pastes, corn syrup, extracts, fillings (pastry), frostings (cake), fruit fillings, fruit jams and preserves, gelatin, gums, honey, hydrogenated fats and oils, icings, invert sugars, lard, malt, meat, mincemeat, molasses pectin, popcorn, powdered milk, shortening compounds, sugar, sugar syrups, vegetable oils.

Steel Containers for Food Packing

Style	Capacity (gal.)	U.S. Gage No.	Style of Opening	Opening Diameter	Approximate Weight (lb.)
Pails	½–12	26–20	lug cover	5½–13 11/16 in.	1–14
Pails	2½–6½	26–24	band seal cover	10½–11¼ in.	3½–6½
Pails (taper)	2	26	lug cover	9½	2½
Pails (jug)	5	24	lug or band seal cover	10½	5½
Pails (spout)	2½–6½	26–24	lug cover with swivel spout	11¼ in.; 2 in. spout	3½–6½
Pails (spout)	1 –12	26–20	lug cover with push-pull spout	8½–13 11/16; 50 mm spout	2 –14
Pails (spout)	2½–6½	26–24	lug cover with reversible spout	11¼ in.; 1⅜ in. spout	3½–6½
Cans	8½–18	30–28	slip-over cover	12¼–15 in.	4½–7
Drums	5 –10	24–22	swivel or "push-pull" spout	2 in. or 50 mm.	5½–10
Drums	15 –65	20–16	lug cover plug	11¼–17½ in.	16½–67½
Drums	14 –65	20–16	bolted cover plug	9–15 in.	16½–70
Drums	15 –65	19–16	friction cover plug	9–15 in.	18½–68½
Drums	15	24	lug cover	16 in.	11
Drums (light gage)	15 –55	26–24	all styles except plug	8½–15 in.	8 –24
Barrels (standard)	15 –65	19–16	2 plugs	¾; 1½ or 2 in.	20 –70½
Barrels (reinforced chimes)	30 –55	18–14	2 plugs	¾; 1½ or 2 in.	40½–93½
Barrels (I-bar rolling hoop)	55	16–14	2 plugs	¾; 1½ or 2 in.	85 –103½
Barrels	30 –55	19–18	Removable Cover	18¾–22½ in.	35 –57½

Closures

Adaptation to Vacuum Packing Marks Five Years Progress



WITH a possible single exception, developments in closures during the past five years have been mainly better adaptation of existing seals[1] to specific types of containers rather than the introduction of something strikingly new.

The probable single exception is the "Vacu-Vent" cap recently announced by the closure division of Armstrong Corp. Products Co., Lancaster, Pa. Like other closures used in the vacuum packing of foods this cap is designed to hold a vacuum as high as 27 in. of mercury.

It is novel in that the seal is essentially a screw cap with a corrugated diaphragm-like top with an automatic valve in the middle of the cap. This diaphragm-like portion of the cap is constructed so that it normally presses downward on a rubber valve ring encircling the valve vent in the lid. The ring is held in place and air tight by a metal spring clip which bridges across the diameter of the cap. A standard rubber sealing ring to fit over the edge of the container under the cap completes the closure. A special coating protects the food from chemical reaction with the cap. The valve opens when the pressure inside the container is sufficiently greater than the outside pressure to cause a bulge or swell in the corrugated diaphragm portion of the cap or when mechanical pressure is exerted on the metal spring clip through the valve hole in the cap.

In either case the pressure of the metal spring clip on the rubber valve ring encircling the valve vent is sufficiently relieved to permit an equalization of pressures inside and outside the container. If done inside a vacuum chamber or if the contents are processed hot a vacuum is created on the contents of the container. If the pressure of the spring clip is relieved by mechanical pressure through the valve vent under atmospheric conditions the vacuum is broken and the cap can be screwed off with ease. This cap is of the reseal type and is obtainable in 48, 58, 63, and 70 mm. for the No. 400 G.C.A. glass finish.

Vacuum closures through use of the various types of Goldy seals of Aluminum Seal Co., New Kensington, Pa.; White caps of White Cap Co., Chicago, Ill.; Anchor caps of Anchor Cap & Closure Co., Long Island City, N. Y., and caps made by Sterling Aluminum Co., Erie, Pa., are essentially adaptations of well-known seals to vacuum packing conditions. Some are of the one-piece screw cap style, some of the one-piece "press-on" and "pry-off" type with and without reseal features, some of the two-piece, double-shell and reclosure type, and some of the one-piece "press-on" type, more particularly designed for thin-wall glass tumbler packaging, capable of holding a 22 to 25-in. vacuum in the tumblers.

A valuable contribution to the development of these vacuum closures has been the Gold Seal cap compounds of Dewey & Almy Chemical Co., Cambridge, Mass. In the case of the thin-blown tumblers particularly, the seal had to be soft and plastic to make allowances for the irregularities in the edges of the tumblers; and, for one-piece screw caps, the seal had to be of a type which would hold the vacuum and yet be conducive to easy removal of the cap for opening the package.

THE composition of these sealing compounds vary somewhat according to the food product to be packed. Each type of food presents a slightly different problem in its effect upon the sealing compound as well as upon the material from which the closure itself is made. The metal portion of the closure can be and is protected by a lacquer or varnish, whereas the sealing compound has to vary in composition.

So well have the closure and the sealing compound manufacturers worked together that the high-wall, one-piece, screw caps and the tumbler caps can be supplied with the sealing compound in liquid form and forced

[1] FOOD INDUSTRIES, 1930, pp. 36-40.

Vacuum of 22 to 25 in. of mercury are maintained by the closures on reuse tumblers.

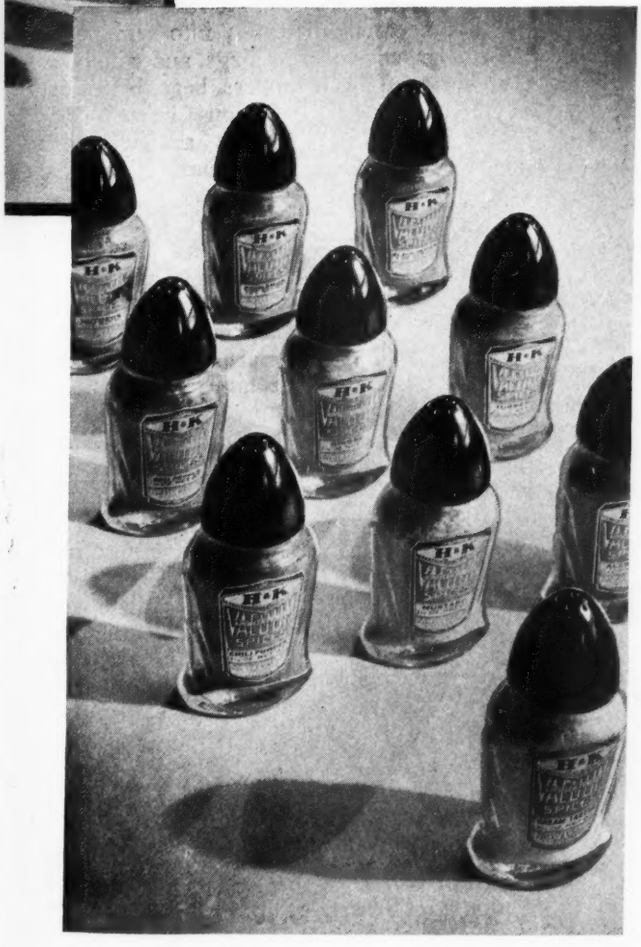
onto the glass container under vacuum conditions at the rate of 200 per minute on the latest fully automatic machines.

ALUMINUM foil caps, hoods and capsules, respectively for milk and wine bottles, and transparent cellulose hoods for milk bottles and caps for wine bottles are of growing importance. When foil closures are used for milk bottles they replace both the paper disk cap and hood, yet give the same sanitary protection because they fit over the top of the bottle. The type of foil closure made by the Sanitary Metal Cap Corp., Syracuse, N. Y., fits down into the mouth of the bottle as well as forms a seal over the bottle-top in hood-like manner. Also foil hoods are pressed onto the bottle tops in such a way that further sealing is unnecessary, whereas the transparent and paper hoods require a sealing tape or wire around the neck of the bottle to hold them in place. The capsules are held in place over the top and upper neck of the wine bottles by a special adhesive that dries firmly onto both the foil and the bottle. These capsules are available in bright and attractive colors.

Plastic closures so generally used on drug and cosmetic containers are being slowly adopted by food manufacturers. Spice and condiment reuse containers are among the first to adopt this type of closure as a shaker top. In recent months containers of other foods are being fitted with these molded closures and their use appears quite likely to become more general in the future.

In collapsible tubes the trend is to the clipless type of closure with leakproof and air-tight features.

Other closures, such as the Sterling, the Lock-tite, the U-Press-It, and reseal crown caps, should not be overlooked. These closures are not new, but only recently option has been taken on the Sterling cap by Reynolds Metal Co., which may reintroduce it to food manufacturers. The Lock-tite seal, heretofore used only by the occasional food or beverage manufacturer because sealing by it was a hand operation, is now applied by machine and very likely will find favor because of its reseal feature. U-Press-It and the reseal crown caps, although used quite widely outside the food field, have been slowly finding acceptance with food manufacturers because of reseal virtues.



Molded plastic shaker tops convert spice and condiment containers into handy kitchen and pantry utensils.

Wrappings

Transparent Materials Win Leading Position

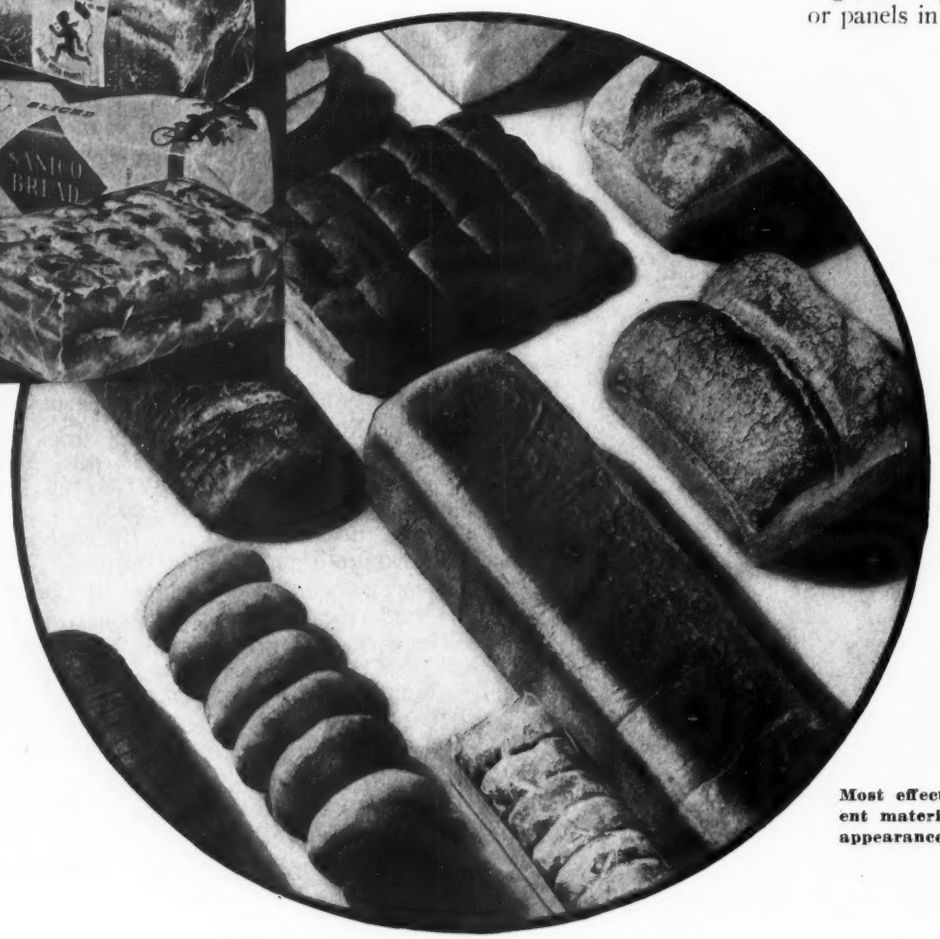
GREATER transparency for their products was the goal of the manufacturers of cellulose wrapping materials as the trend toward packaging of foods became accelerated following the war period.

Not only was the technology of making the well-known sulphite, glassine, and parchment-like papers studied and improved to produce thinner and more transparent, though equally strong sheets, but also new chemically-processed celluloses were introduced. As a result, by 1930 they had come to be regarded as the ultimate in transparency and the ideal packaging material to give decorative protection to the product or to the package containing the product. During the past five years attention has been directed to making these transparent materials more resistant to the transfer and absorption of moisture, to the passage of light rays which influence rancidity in fat-bearing foods, to the effect of changes of temperature, to change in color, and to the development of static during machine wrapping operations.

Also during the past five years much has been done to fabricate these transparent materials into wrappers, bags, envelopes, casings, and windows or panels in wrappers, bags, boxes or cartons in which foods are wrapped or packed.

Left: Opaqueness in a wrapper does give contrast for printing and decorative designs, but transparency is the quality that permits the products to sell themselves.

SPECIAL machines and adhesives have been developed to handle and seal these materials in an automatic manner. The moisture- and the grease-resisting types have necessitated the use of odorless organic solvents, such as "Cellosolve" and "Methyl Cellosolve" of the Carbide and Carbon Chemical Corp. and pressure to get satisfactory seal-



Most effective wrapping with transparent materials results when the natural appearance of the product is permitted to be seen.

One of these wrappings is Riegel special glassine and the other is "Cellophane." Can you tell which is which?

Printing on the wrapper instead of the carton improves appearance of waxed-paper wrapped package. Electric-eye control on wrapping machine gives correct register for printed panels.

ing. Special heat-sealing grades have been introduced for automatic bread wrapping.

Through the development of better inks and methods of using them, color printing and lithography is now as common on these materials as on papers, glassines, or parchments.

The first of these transparent materials to be introduced is that of the du Pont Cellophane Co., known as Cellophane. It has been followed by Sylphrap of Sylvania Industrial Corp., Protectoid of Celluloid Corp., Kodapak of Eastman Kodak Co., Inceloid of American Products Manufacturing Co., Visking of Visking Corp., and more recently Pliofilm of Goodyear Tire & Rubber Co. and Sylvania Sanicase K of Sylvania Industrial Corp.

Cellophane is of the viscose type and available in plain, moisture-resisting, grease-resisting, and M.S.T. or heat-sealing grades. Sylphrap is also of the viscose type and available as plain, embossed, moisture-resisting, heat-sealing, ultra-violet resisting, and "Old Gold" or anti-rancidity grades. Inceloid, Protectoid, and Kodapak are of the cellulose-acetate types, are highly water-, grease- and oil-resistant; but only Kodapak is

Corrugated glassines are new in high-grade biscuit packing. They may be colored and are grease-resisting.

much used for food wrapping. Being highly resistant to humidity and temperature changes these acetate materials make good windows for boxes and cartons. Visking is of the viscose type and used as casing for sausages and meat puddings. The base of Pliofilm is first-grade crude rubber and it is grease-resisting and heat-sealing. Sylvania Sanicase K, while composed of chemically-treated cellulose, is not of the viscose type, but is used as casing for sausages and meat puddings, as is the viscose type.

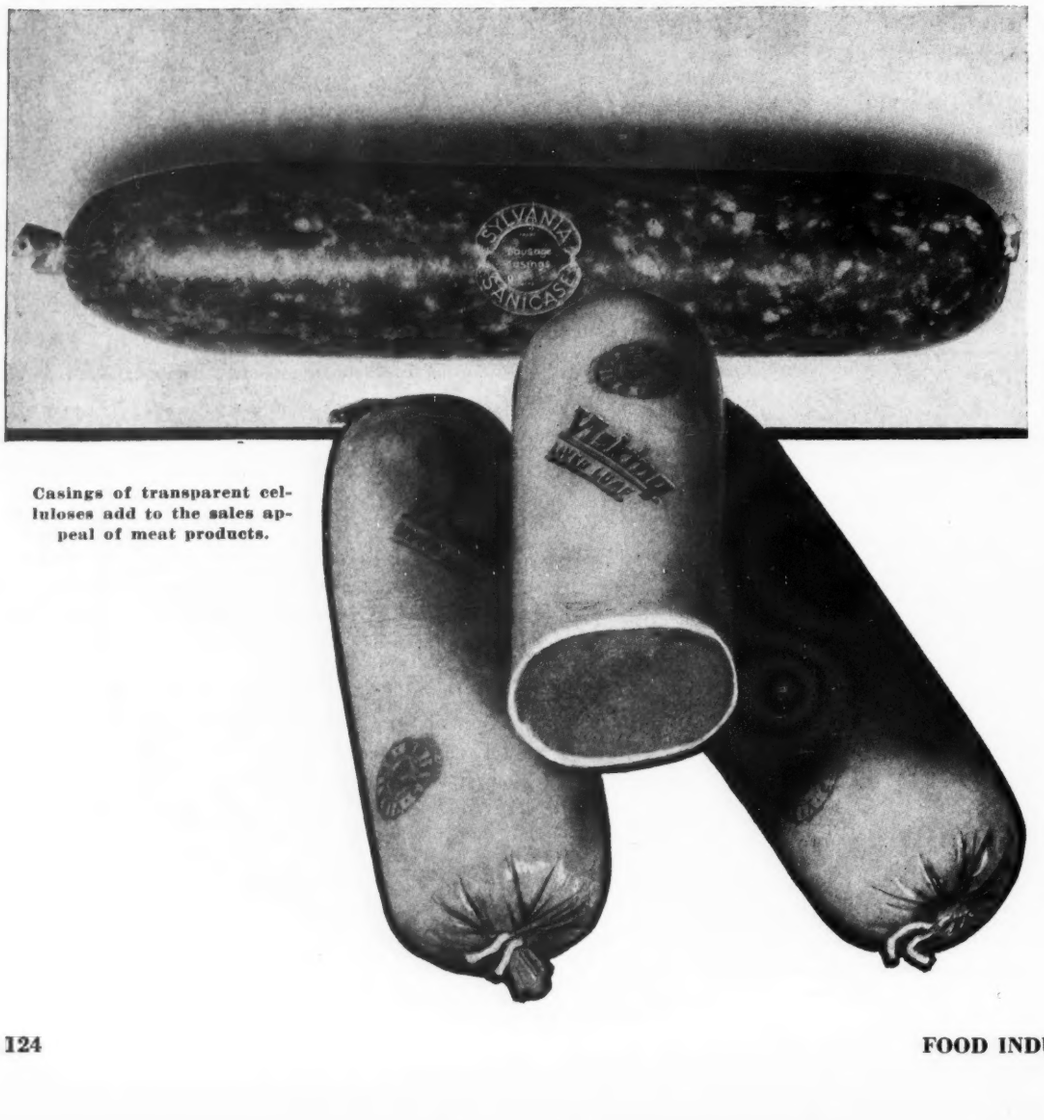
Progress in transparent packaging materials has not been wholly in the hands of the manufacturers and fabricators of these highly transparent celluloses. Manufacturers of waxed sulphite papers, glassines and waxed glassines, and parchments have achieved greater transparency in their papers, but of greater importance is their production of papers on a relatively low-cost basis for specific uses. Almost 100 per cent performance on automatic wrapping and heat sealing machines is one accomplishment. Another achievement is the transfer of printed decorative and informative composition from the container to the waxed wrapper. This is done with such a finish and trueness of register under electric-eye control on automatic wrapping machines that the package has all the protection of moisture-resisting wrapping and the decorative beauty of a printed or lithographed wrapper.

HIGHLY-translucent, parchment-like papers are now available for butter, lard, and meat wrapping, with such effective grease-resisting properties that they can be used as inner liners or lamination layers of inexpensive cardboard containers to protect fat- and milk-containing confections, pastries and prepared mixes against loss of fat to the container and absorption of objectionable flavors and odors by the contents. Crinkled parchments are also replacing the traditional corn husks as wrappers for such products as tamales. Widespread marketing of sliced bread has been responsible for the introduction of a special, fast-sealing paper for automatic machine wrapping of these breads.

These are only a few of the accomplishments during the past five years of such papermaking companies as the Kalamazoo Vegetable Parchment Co., Parchment, Mich.; Paterson Parchment Paper Co., Bristol, Pa.; Riegel Paper Corp., New York, N. Y., and Transpara Paper Co., Rhinelander, Wis. The last-named company, as well as S. W. Weis, Chicago, Ill., has introduced resin-treated papers which in transparency and cost are between waxed glassines and the highly transparent celluloses.

Such notable advances have been made during the past five years in the technology, fabrication, and applications of glassines, especially of the waxed or moisture-proof grades, that they have been faring surprisingly well in their competition with the transparent celluloses. Their transparency has been increased to almost 90 per cent of full transparency and their strength and pliability have been retained. Moisture-resisting qualities are obtained both by waxing and by laminating with wax. Ordinary adhesives are sufficient to give rapid and effective sealing. Also they can be highly decorative by use of color-printing and lithography, embossing, and lacquer.

These papers have made particular progress in the better packaging of bakery products, and as wraps for glass-packed foods. For bag and envelope packaging the highly transparent bleached glassine is much in demand by salted nut, potato chip, and doughnut makers.



Casings of transparent celluloses add to the sales appeal of meat products.

Lily-Tulip paper cups now in 3 to 10-lb. capacities are being used for bulk butter, cream and cheese.

Paper Containers

Cups, Bottles and Cans Find Wider Use in Food Packing

EXPANSION into the dairy, frozen fruit and vegetable industries has marked the progress of waxed paper containers since 1930.

In capacities up to a quart, sealed and unsealed waxed paper cups had previously invaded many of the food industries at least on an experimental basis. In the single-walled grade they have now been widely adopted for individual service containers for ice cream, sherberts, and fruit ices. Double-walled grades have gone farther afield, and in their best-known applications have become containers for such products as ice creams, sherbets, fruit ices, cheeses, butter, oysters, frozen fruits and vegetables, and confectionery. Manufacturers of these paper cups who appear to be getting the widest adoption of their containers by food manufacturers are Dixie Cup Co., New York, N. Y.; Lily-Tulip Cup Corp., New York, N. Y., and Mono Service Co., Newark, N. J.

MOST recent development in these containers is the introduction of the 3-lb., ½-gal., 5-lb., 1-gal., and 10-lb. capacities which are being used for bulk cottage cheese; sour cream; candy, especially "count goods"; and, when inner-lined with three-piece parchment, butter. Attractively printed, waxed, and sometimes covered with Dejonge papers, they are desirable not only as containers, but also for display purposes and re-use as waste paper baskets, wine coolers, champagne buckets, and cracked ice containers. Further uses for these cups or pails as bulk containers are under experimental tests with encouragingly favorable results for the period of time the tests have been under way.

PAPER bottles for single-service delivery, which had their debut in the late 1920's and had been adopted by some of the larger metropolitan milk distributors, found a new use in 1930-31 as containers for frozen orange juice. That of Sealcones, Inc., manufacture with its circular bottom and its metal-sealed, straight-lined top was adopted by the Borden Co. for its house-to-house delivery of the frozen juice. Although the American Paper Bottle Co., Toledo, Ohio, has been promoting its rectangular shaped container and other companies have made bids for wider adoption of their containers no unusual developments have taken place until late 1934 when the American Can Co. paper container appeared on the market

Although designed for milk, Sealcone paper bottles find use with frozen orange juice.

A rectangular paper milk bottle is being given a commercial test by American Can Co.

containing the milk of Castanea Dairy Co., Trenton.

In shape this container is rectangular, $2\frac{3}{4} \times 2\frac{3}{4} \times 8$ in. overall measurements, and requires approximately one-half the storage space of an ordinary milk bottle. It is manufactured in a centrally located plant and delivered sealed and sterilized to the dairy plant. As the surface of the bottle is heavily covered with wax and closed with a friction plug, there is no difficulty in keeping the empty bottle closed and sterile while awaiting use. The bottles are delivered to the dairy as wanted, consequently there is no reason for any bottles being carried in stock.

For filling, the closure is opened by the application of heat to soften the wax and by a vacuum to lift the plug and hold it open during the filling operation. After filling an expanding head plunger forces the plug back into the opening and swells it sufficiently to give a secure seal. Provision is made on the flat top surface of the bottle by means of a tab with a hole in it for lifting the bottle out of the case and when desired, for sanitary reasons, hanging it on a hook or rod out of reach of cats and dogs. A wide flange and lip on the friction plug protects the area about the opening from dirt and aids in making a secure seal over the opening. Also the top of the bottle is shaped to prevent any drip or running of the milk down the side during emptying.

ANOTHER noteworthy use of paper containers is the adoption of cylindrical paper cans by large manufacturers of ice cream during the past two years. This practice has led to economies in transportation, rehandling, washing, and sterilizing expense, as well as first cost. The cans are made from tough durable paper and are fitted with reinforced top and bottom rims to give stability and have corrugated edges to prevent freezing of container to bottom of refrigerated cabinet compartment.

Tin Containers

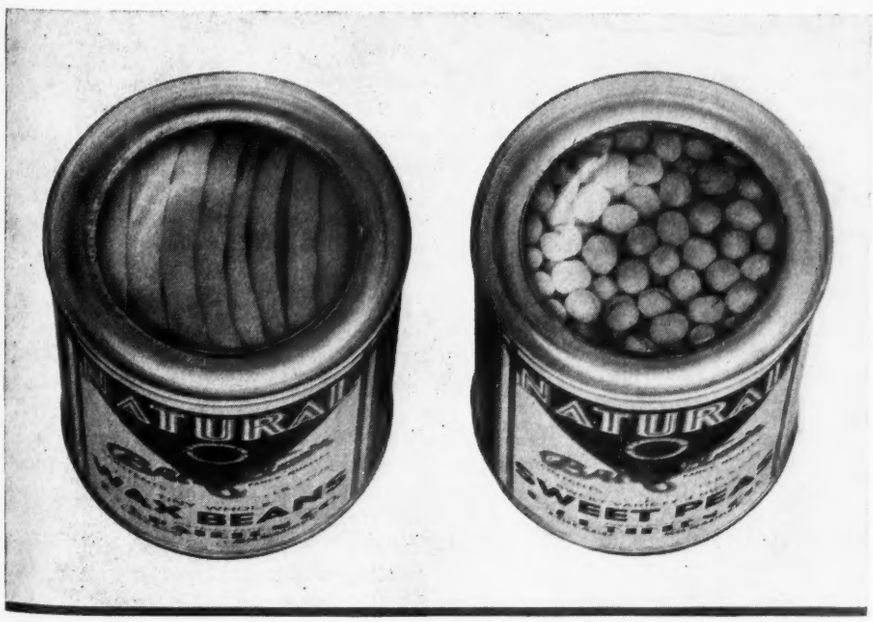
Five Years' Progress Solves Corrosion Problems

ONE very fundamental discovery has been made in tin container technology, since FOOD INDUSTRIES discussed the tin can in January, 1930, and several other improvements of almost equal significance can be reported today.

In 1930, the tin can as a technical, in contrast to a merchandising, package was just emerging from a long period of investigation, research and development stimulated by a host of problems of corrosion, perforation and discoloration. Much criticism and misunderstanding had occurred back in 1917-1922, as a result of the complex ramifications of technical canning problems involving canners, can makers, tinplate makers and steel makers.

Those who were active in the industry in that period may recall vividly the dynamic personality and penetrating criticism by the late Dr. W. E. Elwell, of Burnham & Morrell, Portland, Me., against the quality of finish of the steel in the base plate and the amount of the tin on the sheets.

New can for beer must withstand pressure of about 85 lb. per sq.in. It is enamelled inside with "Keglining."



Left: Window top cans with real glass are for display purposes.

Skipping the very entertaining tale of the steps which led to the most fundamental discovery of the past five years, it can now be said that most of the problems of corrosion of cans and hydrogen gas formation in canned foods have been solved in the commercial sense. If the steel in the base plate be made sufficiently

low in metalloid impurities, the tinplate will withstand the action of food acids for a period much longer than was possible heretofore.

IN THE commercial sense, though not in the strictly scientific sense, the corrosion problem has been solved. The corrosion will still take place slowly, but is delayed far beyond the period over which canned foods should be held.

The new cold reduction process of rolling sheet steel now permits the production of plate in "tin gages" of any desired type. It is therefore now possible to produce sheet steel of any desired specifications to make tinplate for can manufacture, and the benefits of low metalloid steel are now available for canners where special service is required.

In an accelerated comparative corrosion test on red sour pitted (R.S.P.) cherries, it is indicated that resistance to corrosion will be greatly increased, by about two years, under ordinary temperatures of storage. American Can Co. pioneered the application of the new special steel in can making, but other can companies are now also able to supply cans from these new types of plate where necessary.

Fortunately, tinplate of correct metalloid content can be produced and made into cans at no added cost in the United States. Low metalloid plate should be used for all products which produce hydrogen springers or perforations, such as pureed prunes, black cherries, R.S.P. cherries, strawberries and sauerkraut. Medium metalloid plate is suitable for many other products.

CANNED BEER, first introduced on Jan. 24, 1935, at Richmond, Va., after several years of investigation by American Can Co., has become a commercial possibility through two important can-making developments: (1) A can able to withstand an internal pressure of about 85 lb. per sq.in.; (2) a special inside enamel called "Keglining" by the can company. Other equally important parallel developments were the special beer-can-making machinery and the special method of opening the cans.

A wholly new type of body seam and can end has been made necessary to insure the strength of the beer can against the high pressure of carbon dioxide which is in beer under summer heat without refrigeration. Although the new can body has been ready for some time, the appearance of canned beer on the market had to await the development and testing of proper interior enamel which in character and appearance is a marked departure from traditional enamels.

A NEW form of key-opening can, attracting much attention at the 1934 canners' convention, was the Western Can Co.'s development, which did not lose height when the tearing strip was removed. Heretofore key-opening cylindrical cans could be used only for dry products, because the half-inch shortening on opening would cause liquids to spill. The novelty here involved is a triple zigzag fold of the body plate at the top, with the scoring on the outermost layer. Thus, when the tearing strip is removed, the full body height remains and obviates spilling. Continental Can Co. now also supplies this can under license from Western Can Co.

A slightly different can, serving the same purpose, has been developed by American Can Co. It is described as a special key-opening can for liquid products, the chief features of which are the very deep countersink of the top and narrow scoring. This displaces enough of the contents so that all material in the can is below the height of the tearing strip. The top is considerably domed, although the bottom is the usual flat bottom. Hills Brothers Co. used it last season on part of their cranberry sauce, and it has also been used on Pacific Coast fruits.

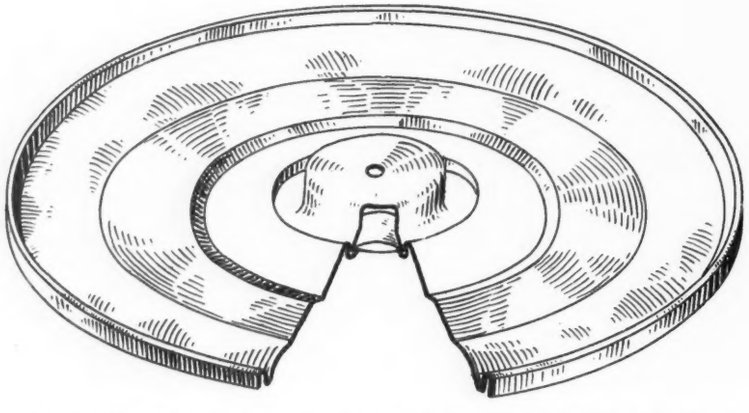
A VALVE can for cheese ripening which has been put on the market by Continental Can Co. has been described recently in FOOD INDUSTRIES, July, 1934, page 308. The important feature here is an inexpensive yet effective check valve to release gases formed during ripening of rindless cheese in cans.

A window top can is a very recent development. It is a merchandising aid rather than an ordinary commercial package. The window, actually glass, represents a joint development of Continental Can Co. and Corning Glass Works. The glass is sealed into the can-maker's end rather than the packer's end.

IN 1931, R. B. Davis Co. began to market its baking powder in a new style of friction top can, immediately under the outer lid of which was an air-tight parchment paper inner seal which is tamper-proof. The Wander Co. now uses a piece of aluminum foil in a similar manner for export packages of Ovaltine, where absolute moisture-proofness is needed. The latter is made by Continental Can Co.

Constant progress has been made in the lacquer and enamel coatings for tinplate. Efforts to produce a beer can have necessitated the development of a new type of enamel for interiors. American Can Co. has produced "Keglining" for this purpose. Other can makers are at work but have not yet made announcements. Ault & Wiborg Corp. has very recently offered special interior enamel for service in spinach and asparagus cans.

Cross-Section



Illustrating the essential features of the valve can for cheese ripening.

Wolf award winner. Club Soda bottle of Hoffman Beverage Co.

Prize Packages

The best food containers of 1934, as judged by two A.M.A. juries

FOOD PACKAGES came in for a lion's share of the honors in the annual package competition sponsored by American Management Association. The grand prize, the Irwin D. Wolf award, went to the Club Soda bottle entered by Hoffman Beverage Co. It was designated the "best package developed and placed on the market during 1934." And eleven other food containers received awards or honorable mention for distinctive merit in packaging design and for distinctive merit in technical packaging development.

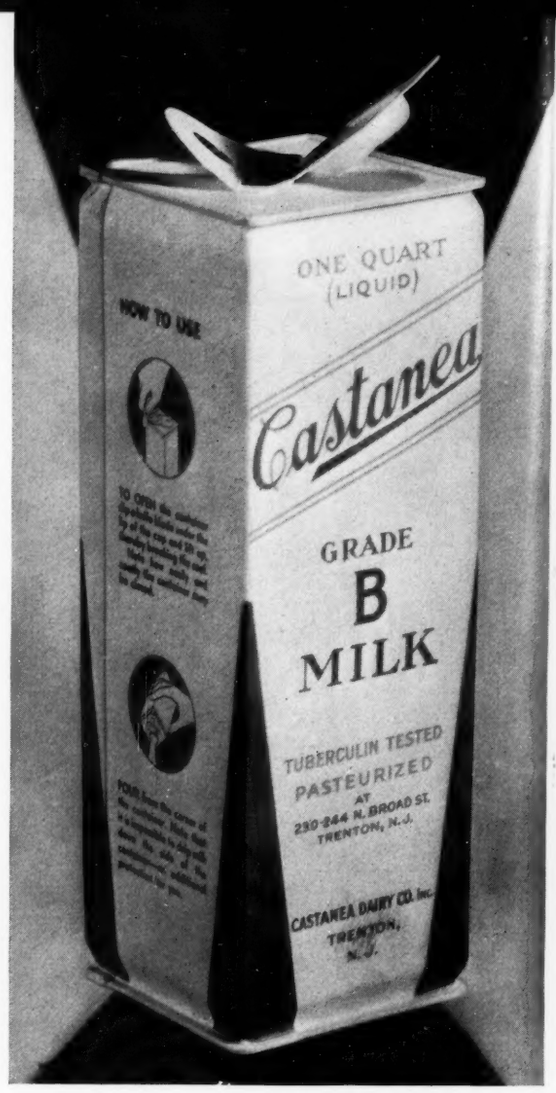
Among the packaging design awards, that for the best wood container was given to the fancy fruit and vegetable display crate entered by General Box Co., Inc. As the best shipping container, the judges picked a barrel with a four-piece, quick-removable head with curved bilge hoops entered by Procter & Gamble Co. First honors for merchandising ingenuity were given to the fiber milk container entered by American Can Co.

In addition to these firsts, four food packages received honorable mention for merit in packaging design. In the folding-carton group, a single-face, corrugated carton for pastry, entered by Van Doren & Rideout, received mention. In the display container classification, honorable mention was won by the chewing-gum package of American Chicle Co. The sugar carton entered by Robert Gair Co., Inc., was honored for merchandising ingenuity, while the "Pad-U-Pak" berry crate entered by Paducah Box & Basket Co. received mention in the shipping-container group.

Among the winners of awards for merit in technical packaging development was the collapsible tube entered by F. J. Stokes Machine Co. Four other food containers received honorable mention for technical development. These include the "Keglined" beer can of American Can Co.; the metal-foil potato-chip package entered by Reynolds Metals Co.; the metal-foil wrapping for smoked shoulder entered by Reynolds Metals, and the quick-removable tierce heading entered by Procter & Gamble Co.

THE champion of them all, the Hoffman Club Soda bottle, not only is attractive, but it effectively merchandises the "Sparkling Water" which it contains. The container is of clear glass and is "corrugated" from the

Shipping container of Procter & Gamble Co.

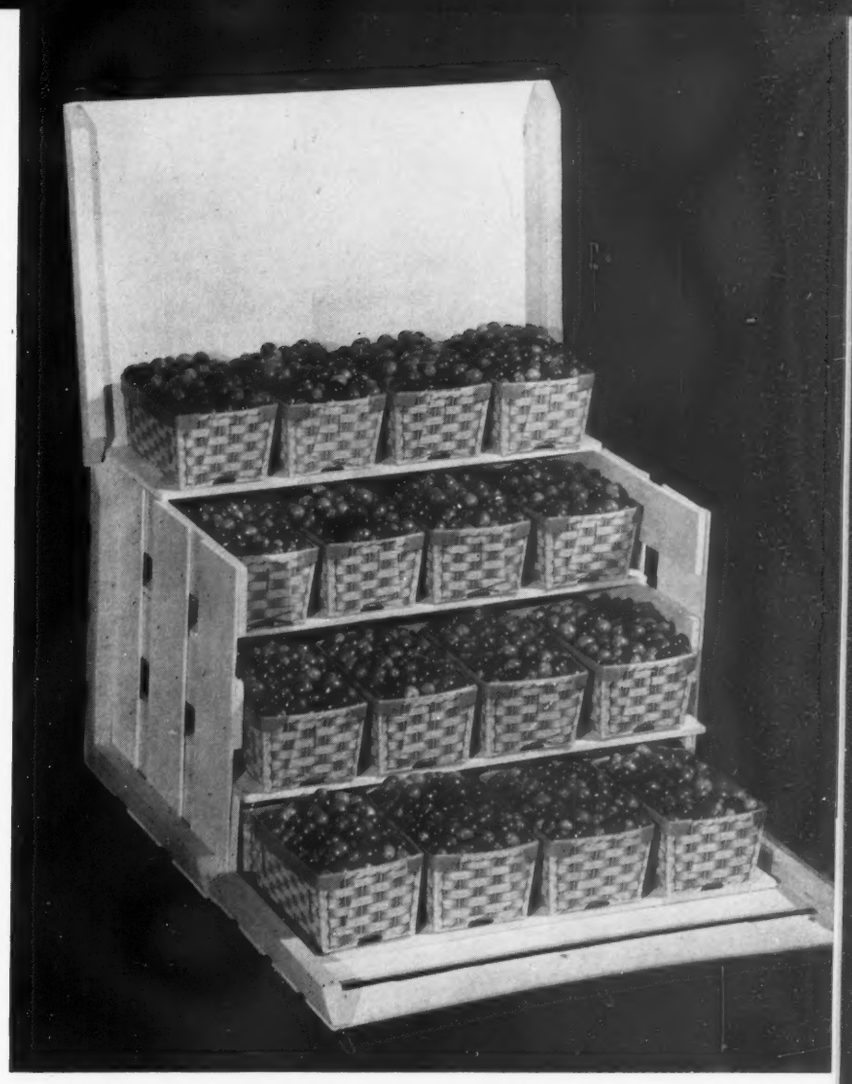


Fiber milk container by American Can Co.

Chewing-gum package of American Chicle Co.

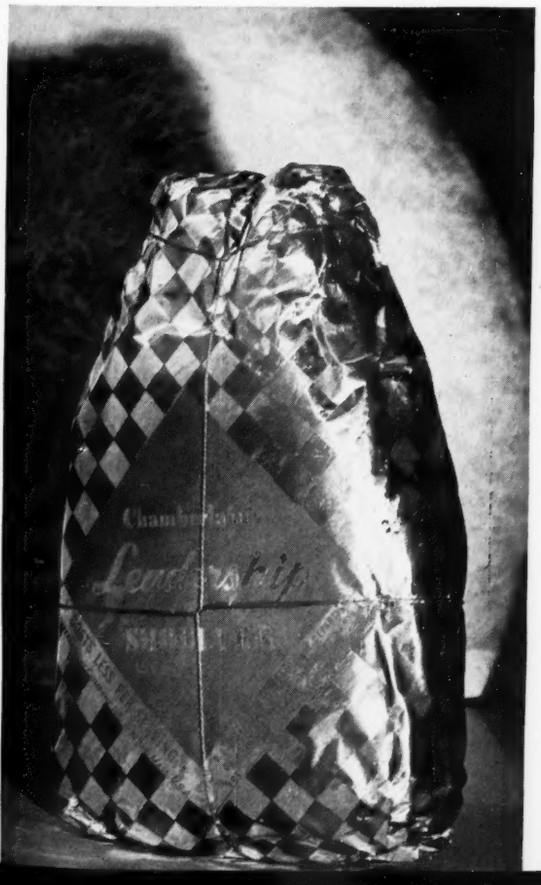
"Keglined" beer can by American Can Co.

Cane sugar carton by Robert Gair Co., Inc.

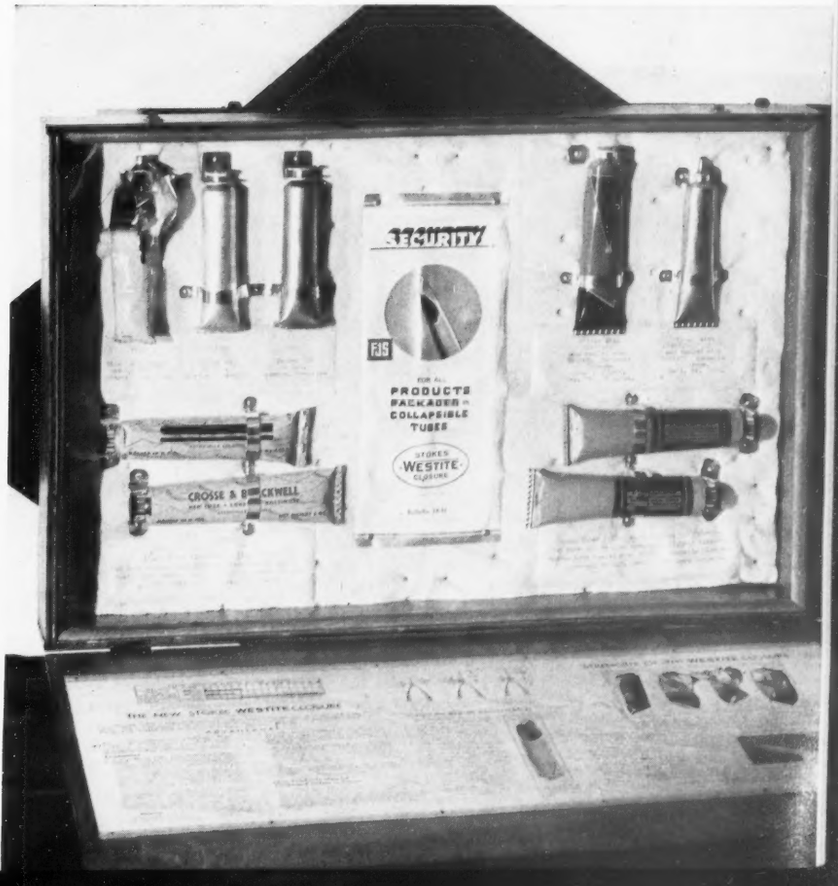


Fancy fruit and vegetable display crate by General Box Co., Inc.

Metal wrapper by Reynolds Metals Co.



Collapsible tubes by F. J. Stokes Machine Co.



label to the neck. It has an outside cap of foil-covered paperboard, foil body and neck labels and crumpled foil around the neck. An unusual feature of this package is that the back of the body label is printed with a sales story which may easily be read through the unlabeled side of the bottle.

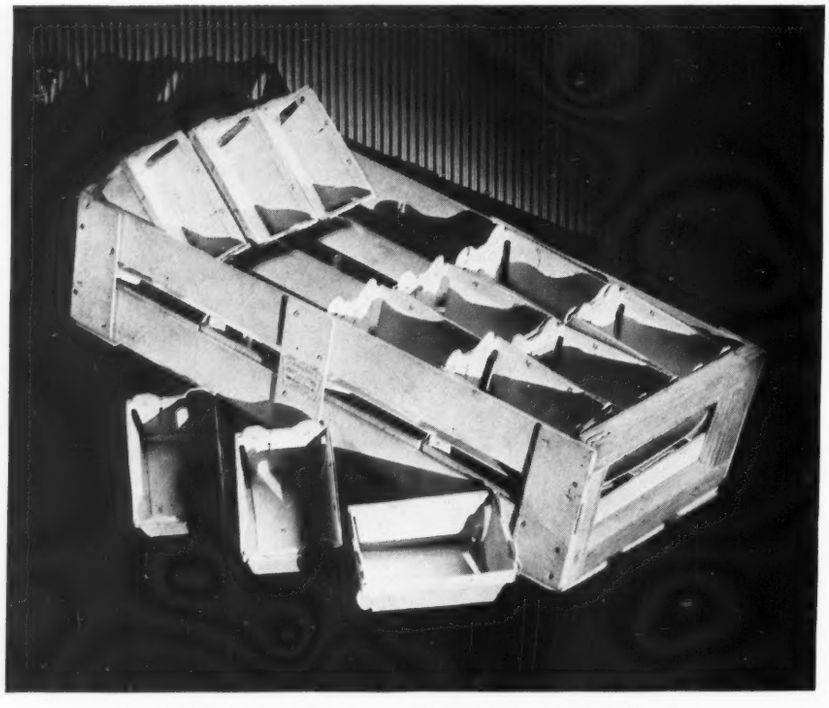
The display crate of General Box Co. is of light-weight, wood construction, bound on four sides with wire. The important thing about this container is that its partitions will slide forward after the front and top have been opened to form display shelves.

While fiber milk containers have been made before, perhaps none of them come up with that designed by American Can Co. in merchandising ingenuity. This, a rectangular container, has in the top a small circular opening which is closed by a cardboard flap. The can company supplies the container already set up, sterilized and hermetically sealed, and a machine in the dairy plant breaks the seal, introduces the milk and recloses the container.

Important improvement in wooden barrels is incorporated in the head entered by Procter & Gamble Co. This head comprises two "half" sections, a two-piece center board between the sections to hold them in place and a wooden cross bar which slides under metal holders to fasten the center members in position. The head may be removed quickly by displacing the cross bar and using a hammer to dislodge the center members.

Primarily intended as a package for retail bakers, the single-face, corrugated, folding carton of Van Doren & Rideout not only is attractive, but affords good protection to its contents. And it is light in weight.

The display container of American Chicle Co. is made of heavyweight transparent cellulose, bent at right angles to form the front and sides. A piece of cardboard forms the bottom and back and extends upward so that it may carry a sales message.



"Pad-U-Pak" berry crate by Paducah Box & Basket Co.

Metal-foil bag by Reynolds Metals Co.

CONSUMER convenience similar to that afforded by the pouring-spout, salt container is found in the cane-sugar carton entered by Robert Gair Co., Inc. The outer flap of the top has a perforated strip which may be torn loose and pulled back to uncover a pouring hole in the inside flap. When placed back into position, the end of the strip is inserted in a slit to hold it closed.

By virtue of a simple trick in the design of the "Pad-U-Pak" crate, one layer of boxes may be set on top another without danger of crushing their contents. On the piece forming the bottom and ends of a box are projections which support the divider between layers.

A winner among the packages judged for merits in technical development, the collapsible tube of F. J. Stokes Machine Co. is distinguished by its leakproof seal. By applying a special cement before folding the end of the tube, the company has developed a closure which not only is leakproof, even against kerosene, but which will stand a pressure sufficiently strong to burst the sides of the tube.

Having a great many advantages, such as light weight, no returns, elimination of bottle washers and protection of the contents against light, the "Keglined" beer can of American Can Co. is an important development in beer containers. This can has a special lining similar to the pitch in beer kegs.

Protection against the light which causes rancidity, against absorption of moisture which destroys crispness, and against soiling with grease are the technical attributes of the metal-foil, potato-chip bag of Reynolds Metals Co.

Protected from heat by foil.

Insulation

By Francis Chilson

ONE of the elements of package construction that needs more consideration is heat insulation. Products such as chocolate and salad dressings cannot withstand heat and the flavor of many other products is impaired when they are exposed to heat.

Recently, I witnessed a demonstration which should be remembered by all food packagers, one which, like many discoveries, was more or less accidental. A chemist was developing an emulsified salad dressing similar to mayonnaise. Wishing to shelf-test it, he put the experimental batch into several different types of containers which happened to be lying about the laboratory, of which some were glass, some were treated paper-board, some were metal and one was of a plastic material. The packages remained on the shelf for about two months through the abnormally intense heat of last summer. In the early fall, when the packages were taken down and examined, the only one which had not separated was that in the plastic container. The samples in glass and in tin had separated badly. That in the foil-lined paper drum had separated only slightly.

This experience led to a study of package insulators, and for the first time that chemist realized, what he had always known if he had stopped to think about it, why chocolate bars are wrapped in aluminum or tin foil. Foil is one of the best insulators, because it reflects heat. A foil-wrapped chocolate bar will stand up much longer than one wrapped with paper.

The insulating value of foil was demonstrated at the last Packaging Show. Pieces of chocolate were wrapped in foil and in paper, and placed over a heat source where both were subjected to the same temperature conditions. In a few minutes the paper-wrapped sample had melted and when the foil was removed from the foil-wrapped sample the chocolate was still cold. This does not mean that the foil-wrapped sample would have remained indefinitely in contact with heat without melting, but shows that foil possesses a higher resistance to heat transfer than plain or treated papers. Foil is also resistant to cold and is moisture-proof.

AT THE present time one of the largest of the foil-paper companies is conducting tests with cartons and shipping cases lined or covered with pure aluminum foil. Other paper companies are experimenting with treated stocks. Clay-coated stock is a better insulator than calendered stock. Parchment and glassine are better insulators than ordinary untreated papers. A development in this connection consists in the use of asphalt-treated papers for lining shipping cases.

This need for providing heat protection can be met in several ways, regardless of the materials out of which the container is made. A glass or tin container with a wrap-around label, whether or not of foil-coated paper, is better insulated than the unprotected package. Some packages are, incidentally, protected against heat when protected against breakage by the use of corrugated cartons or even plain paperboard cartons.

INSULATED paperboard has interesting possibilities. If foil is one answer to the insulation problem, it is possible that we may yet see cereal cartons of foil-lined paperboard requiring no wrapping, since the foil lining would be both moisture- and heat-proof. One foresees, however, practical difficulties in gluing carton flaps faced with foil, as ordinary adhesives do not adhere well to it. The answer will probably be given by the cost of this type of packaging. Certainly, a foil-lined carton, if it met moisture-proofing requirements, would require no wrapping, thus saving cost of operation and wrapper.

Butter and ice cream offer a field for insulated packaging materials which will not be overlooked if the proponents of foil-lined board are successful in their efforts to reduce its cost.

Good Form

Production packages must be variations of one of four basic shapes

By FRANCIS CHILSON

Consulting Production Engineer
New York, N. Y.

IN A PACKAGE, as in a woman, it is shape that counts. Most of the difficulties we production men encounter in putting both old and new packages through the plant are concerned with shape of the package. Size, color, and, within limits, ornaments do not bother us much. It is *shape* that gets us into trouble.

How can we determine before designing a new package what constitutes good form in packaging? Before we can answer this in detail, it is necessary to make certain qualifications. In the first place, we must define the term "production package." To us this means a package which can be assembled entirely by *standard automatic machinery.*

To give an even clearer picture it becomes necessary to define "automatic" and "standard." An automatic machine is one which feeds, processes and discharges the package without requiring an operator to touch it. If an operator is required to touch the package in any way, the machine is not automatic but is semi-automatic.

A standard machine is, of course, one which is *not* built especially for a particular package. It contains interchangeable parts. This is mentioned specifically, because it is possible occasionally to design a special machine to handle an unusual package which could not be processed on standard equipment.

BEFORE we can proceed with our thesis we must pause to consider the elements of a semi-automatic machine. This is, as previously inferred, a machine which requires one or more operators to feed it or to remove the processed containers; or it is one which requires an operator to feed the supplies as, for instance, a capping machine that does not feed its own caps from a hopper, but requires a girl to handle them in some manner. We are emphasizing this type of equipment somewhat because it is always possible to perform operations in semi-automatic equipment that cannot be performed by automatic equipment.

It is seen, therefore, that form determines very largely whether a package can be classified as a production package, a semi-production package or a hand package. The hand package is rarely encountered in the food industries because of its high conversion cost. It is a type of package which can be filled by machinery, but which is not amenable to any other mechanical operation. So with this comment we shall forget about it and return to the semi-automatic package, because the semi-production or semi-automatic package is the hybrid which constitutes the reason why production men are invariably profane.

It is a cardinal error ever to design or to adopt a semi-automatic package for any product whatever.

It should be borne in mind that a production package can always be turned out with semi-automatic equipment, but the reverse is *never* true. Notwithstanding, the semi-automatic package is always with us for many reasons. The first is that they originate in the small plant which hasn't sufficient volume to utilize automatic equipment and never expects in some cases to get it. It is strange, though, how many products grow to large volume in spite of inauspicious beginnings. When volume comes, whether anticipated or not, the headaches begin. The second point of origin is in the very large plant, which produces a diversified line consisting of numerous specialty items that for reasons of restricted use or high price never become mass production items.

Such factors, however, should never betray anyone into adopting a semi-automatic *package.* We do not mean to infer that semi-automatic *equipment* is non-essential; it is essential and always will be.

The point to be remembered is that a production package always can be handled easier on semi-automatic equipment than the package which cannot be handled any other way.

ANOTHER point to be remembered is that the production package is cheaper to buy in the first place because it is a lot easier to make.

Still another consideration is that production packages make it possible to utilize automatic equipment even when the volume on each item is too small to warrant such an installation.

Differences in labor costs cannot be mentioned because

of the NRA. But this much is obvious: In order to accomplish standardization it is not necessary to adopt a standard package for all items. All that the manufacturer is asked for is that the height, width and thickness of the containers be uniform. We ask for—and get—a standard closure. We ask for unobstructed label spaces. Within these specifications one manufacturer worked out five different containers for his several products, and although their several dimensions are standard, they do not resemble each other in the least. Some have (they are all glass bottles) knurling around the shoulder. Others have embossed decorations above and below the label space. The labels on all are radically different in color and design treatment. Some are different in size, but all are similar in shape. It was necessary to use on this line two filling machines (because of the chemical nature of the products), one automatic capper, one automatic labeler, one automatic cartoner—all of which, to provide flexibility, are adjustable.

BEFORE discussing ideal production forms we must point out that occasionally it is possible to produce automatically a semi-automatic shape, provided some of the packaging operations are eliminated. A good example of this is the "Goldfish" marmalade bowl of Crosse & Blackwell. This hemispherical jar is filled and capped only, being identified by means of the cap. No attempt was made to label it, to wrap it or to shove it into a carton—all of which would have been impossible.

Now that we have mentioned certain qualifications we can begin to consider shapes which either make or break a package—those which determine finally whether the package is a production package or a semi-production package.

The ideal production shapes are: the cylinder, the oblong, the rectangle and the cube.

Beware the spherical, oval, triangular, conical and also certain tapered forms, for they are all, without exception, non-production shapes.

In making this classification we are thinking of all packaging operations, filling, capping or sealing, labeling, cartoning, wrapping. It is of no value to point out that a triangular piece of Swiss cheese can be wrapped and labeled automatically because cheese wrapping machines are peculiar to the dairy industries and cannot be used anywhere else for any other purpose. Therefore, this type of machine falls within the category of special machines discussed in the opening paragraphs.

THE advertising man (damn him) will protest the shape limitation imposed under the head of "production packages." He will jump to the conclusion that if our limitations were strictly followed all packages would look alike. Our first rejoinder would be to point out that all the successful products on the market are packaged in containers of simple lines, and that, as a matter of fact, we cannot think of a single outstanding product which is packaged in an odd or peculiar shaped package. Our next rejoinder would be to point out the great majority of packages conform to these shapes and yet they do not look alike. Let's list some of them:

Cylinders: tin cans, paper drums, round bottles.
Oblongs: butter, ice cream and cracker packages.
Rectangles: cartons for beans, prunes, apples, etc.
Cubes: tea cans, codfish cartons, etc.

These shapes do not in any way determine the selection of the packaging materials. All of them can be obtained in tin, glass, paper-board or plastics.

The shapes, moreover, do not in any way limit design. Let us take a rectangular bottle, for instance. Round off the shoulders and you have a modification which is different from its prototype. Bevel off the corners (not too much) and you have another. Taper the sides (very slightly, and from the base to the shoulder—never the other way) and you have still another. Mottle, emboss, knurl to your heart's content anywhere on the bottle excepting on the label surface, and the number of different looking containers you can produce with a single shape is limited only by your own ingenuity.

Let us all remember that the package is an engineering unit and any attempt to design it without considering its technical functions is inevitably doomed to failure.

Packaging EQUIPMENT *and* SUPPLIES

Tea ball can with metallized paper liner.

"Corroflex" wrapping material.

Accurate Weight Filler

FOR ACCURATE weight filling of dry material into large containers such as those used for restaurant and hotel supplies Stokes & Smith Co., Philadelphia, have just introduced a new machine. Similar in appearance and construction to their "Universal Auger" type filler, this machine differs from it in that it possesses two filling hoppers—one delivers the charge and the other tops-off to secure the utmost accuracy in weight. The container is placed under the first hopper where it receives the bulk of the charge. Then the operator slides it over under the topping-off hopper, and places an empty container under the charging hopper. The topping off mechanism dribbles in just enough material to obtain accurate weight, which when achieved, trips the weighing mechanism and shuts off the supply.

Cushion Wrapper

COMBINING the soft, cushioning effect of corrugated paper with the strength and toughness of Kraft wrapping paper, "Corroflex" has been introduced by Sherman Paper Products Corp., Newton Upper Falls, Boston, Mass. This wrapping material, as shown in the illustration, consists of two sheets, joined with a vegetable adhesive that will not scratch hard or polished surfaces. The inner sheet is a light, flexible, corrugated paper, while the outer is a heavy Kraft paper. The material comes in light and heavy weights, in rolls 9 to 51 in. wide and in sheets cut to fit requirements.

Metallized Paper

AMONG the recently developed packaging papers, E. I. du Pont de Nemours & Co., Fabrics Division, announces the production of a metallized paper for labels, wraps and inside liners. This product is being distributed by Coy, Hunt & Co., 259 West 10th Street, New York, N. Y.

In this paper, the metal coating is deposited directly on any of a wide variety of paper stocks, providing a smooth, high lustre metallic finish resembling foil. Because the finish is applied directly to the paper, there is no lamination or possibility of peeling. The color is chromium-like. It will take printing and lithographing, as long as the inks used are suitable to the surface, which will not permit penetration. The paper can also be die-stamped or embossed.

When used as a wrap, this metallized paper can be cemented to itself with commercial types of adhesives. The finish resists oils, greases, water, humidity, tarnish and corrosion. It protects the contents of the package or container. The product is available in continuous rolls up to 40 in. in width, and in sheets of even greater length.

Bag Packaging Unit

AS A UNIT for opening, weight-filling and closing bags, Amsco Packaging Machinery, Inc., 122 Centre Street, New York, N. Y., offers three machines that may be installed along a conveyor belt in tandem, and require the services of only two operators. These machines are a bag opener, a weighing and filling machine and a bag crimper. This packaging equipment is designed especially for use with any ordinary materials packed in bags or envelopes of heat-sealing material.

The bag opener is equipped with a motor and blower. It will accommodate bags from 2 to 7 in. wide and from 1 to 10 in. high, holding from 500 to 1,000 bags at a filling, depending upon size. It is adjustable for different size bags. In operation, a constant blast of air keeps the front bag open. The operator lifts the open bag and places it under the filling machine. The feed then forces the whole line of bags forward, opening the next to be used. For operation, the machine requires bags constructed with a lip of some kind to permit the air blast to function.

The weighing and filling machine will handle most materials, but is particularly designed for those of non-free flowing character. It operates at from 10 to 22 bags per minute, depending on the material, filling to accurate weight. It is operated by the same operator who handles the bag opener, by holding the opened bags under the filling spout and then placing them on the conveyor belt.

The bag crimper is primarily for heat-sealing materials, but can be supplied with glue wells when an adhesive must be used. The machine can also be supplied with or without a spring conveyor belt built into the trough. In operation, if the conveyor belt is used, the operator picks up the filled bag, places it in the crimper and the rotary motion of the crimping wheels, and the action of the conveyor belt carries it on through the machine while the closing is completed, delivering it on the other side to suit plant conditions. Usually a chute is built on the delivery side so that the closed bags slide down it to a conveyor belt which carries them to the packing table.

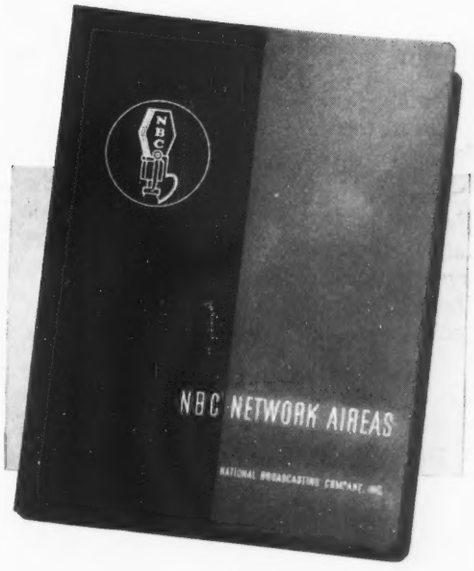
New Packaging Catalogs

Nails—Analyzing nails from the standpoint of construction, use and serviceability is the subject of a new booklet on nails published by Angell Nail & Chaplet Co., Cleveland, Ohio, in which the strong and weak points of ordinary nails are discussed along with the results experienced in actual use.

Labeling Machine—An automatic labeler of use in labeling a wide range of bottles, jars, tumblers and other packages is described in a recent bulletin of the Oslund Bros. Machine Co., Holden, Mass.

Packaging Equipment — Recent publications of Amsco Packaging Machinery, Inc., 122 Centre Street, New York, N. Y., describe a dual slitter and cutter for Cellophane and similar materials, wrapping machines, roll feed sheet cutters, crimping machines, and a bag packaging unit made up of three machines.

PROMOTING *the Product . . .*



National Broadcasting Co. has combined field-strength radio-signal measurements with an analysis of 1,500,000 letters from listeners to produce a new measure of potential radio "circulation." From this it has prepared a large booklet. "N.B.C. Network Aireas," showing where potential circulation lies geographically and how large it is numerically.

▶ KRAFT-PHENIX CHEESE CORP. will use full color pages in national magazines, will continue the Kraft Music Hall radio program and will employ store displays. The magazine ads will show new ways of using cheese and will stress its nutritional values.

▶ KROGER GROCERY & BAKING CO. offers free food for a family of four for five years to the person writing the best letter on "Why I like Kroger's Hot Dated Coffee."

▶ BORDEN CO. will spend $2,000,000 this year to promote ice cream.

▶ ASSOCIATION OF PACIFIC FISHERIES will spend $750,000 in a three-year campaign on salmon. Canners will contribute 5 cents a case.

▶ ADOHR MILK FARMS, INC., Los Angeles, has distributed to all customers a date pad with pages which, when torn off at night, may be used for the next morning's order.

▶ HILLS BROS. CO., New York, is distributing in Chicago 50,000 samples of "Dromedary" gingerbread mix.

▶ QUALITIEE DAIRY PRODUCTS CO., San Diego, recently attached to the milk bottle for each of its 4,000 customers a bright new penny and a printed statement that if the penny be placed in the bottle the consumer would receive the "biggest thing a penny ever bought." Exactly 2,634 people followed the suggestion and received a bottle of vitamin D milk with promotional literature attached. Result: 1,200 regular customers for the product. Billboard advertising led up to this "stunt."

▶ HYDROX CORP. AND WALGREEN DRUG CO., Chicago, are adding vitamin D to ice cream for promotional purposes. The vitamin does not add materially to the cost and the product commands no premium price.

▶ GENERAL MILLS, INC., Minneapolis, will conduct a specialty-bread school for bakers, comprising four ten-day sessions beginning April 8, April 22, May 6 and May 20. Bakers will be shown how to boost profits with specialty breads.

▶ FOOD MANUFACTURERS spent $8,568,731 for N. B. C. radio programs in 1934, ranking second only to the drugs and toilet goods industry. Standard Brands, Inc., and General Foods Corp. each spent more than $1,000,000, while General Mills, Inc., and Kraft-Phenix Cheese Corp. spent between $500,000 and $1,000,000 each. Seven other food companies spent between $200,000 and $500,000.

▶ CANADA DRY is telling the public that its sparkling water has "longer life" and describing a test to prove it.

▶ SWIFT & CO. have adopted cut-out cartons for Brookfield butter, pictures of Brooksie and her pals being used.

▶ CHARLES GULDEN, INC., has increased its sales force about 25 per cent and its advertising program 5 to 10 per cent.

▶ PURITY BISCUIT CO., Salt Lake City, is sponsoring for children a Mickey-Mouse show to which the admission charge is one empty carton from "Three Little Pigs" cookies.

▶ STANDARD BRANDS, INC., Coca-Cola Co., National Biscuit Co. and Spreckel's Sugar Co., will exhibit at California Pacific International Exposition, to be held at San Diego, May 29-Nov. 11.

▶ GEBHARDT CHILI POWDER CO., Dallas, will spend 25 per cent more on advertising this year than in 1929.

▶ DWYER BROS., St. John, N. B., is using something new for cracker bakers —house-to-house canvasing and delivery.

▶ RUSSELL MILLER MILLING CO., Milwaukee, is conducting a sampling and advertising campaign in Milwaukee to promote Occident biscuit mix.

▶ STEWART & ASHBY COFFEE CO. recently exhibited at the Rotary Club exposition in Chicago.

▶ SEEMAN BROS., INC., New York, recently carried in *Table Talk* an ad, suggesting White Rose sea food specialties for Lent.

▶ A. W. STEVENSON, a sales supervisor for John Morrell & Co., has been assigned to direct sales for the Sioux Falls, S. D., branch.

▶ HAROLD H. HAMLIN has been appointed sales manager for Morton Milling Co., Dallas. He formerly was sales manager for Collin County Mill & Elevator Co., McKinney, Tex.

▶ NEW YORK STATE'S MILK PUBLICITY CAMPAIGN, which reaches 15,000,000 people and is financed by a tax of one cent per 100 lb. of milk on producers and distributors, apparently is getting some results. Milk companies report increase in sales amounting to 5 or 6 per cent.

▶ FAIRMONT CREAMERY, Columbus, O., recently gave to charity 10 cents for each quart of Whitehouse ice cream sold in one week.

▶ G. KRUEGER BREWING CO., Newark, N. J., recently inaugurated a test campaign on its canned beer in Richmond, Va., newspapers. If successful, the program will be extended throughout the company's distributing area.

Protecting Commodities With Temperature and Humidity Control

During shipping and storage fixed conditions must be maintained to hold quality of fish, meats and vegetables

By HARRY STINER
Los Angeles, Calif.

SUGAR, chocolate, nuts, coconut, and spices were discussed in an article in FOOD INDUSTRIES for February, 1935, dealing with container choice, shipping methods, storage, and pest control. In this article the discussion is continued with vegetables, meat and fish, and shortenings.

Vegetables

CONTAINERS

For green, succulent vegetables use wooden crates.

Potatoes, beans, peas, old onions, and desiccated vegetables should be shipped in jute bags.

SHIPPING

Food plants handling fresh vegetables are generally located within the growing area. Vegetables shipped greater distances are usually handled in refrigerated vehicles, in which the humidity and temperature should be controlled to conform closely to storage requirements. Such ripened vegetables as potatoes and onions may be shipped in clean, dry vehicles at any ordinary temperature from 34 deg. F. up, provided they have not been stored below that temperature. If taken from storage below 34 deg. F., every effort should be made to hold this temperature during transit. Dry beans and desiccated vegetables may be shipped in clean, dry vehicles, at any reasonable temperature.

STORAGE

Green vegetables are seldom held for extended periods or at a specified temperature. These products require a humid atmosphere to retain freshness and when held for any length of time the humidity should be closely controlled. The optimum percentage varies somewhat with the variety and is usually determined by its appearance. Too much moisture will cause vegetables to rot prematurely.

Potatoes and dry onions are usually held around 34 deg. F. A temperature of 30 deg. F. is considered dangerous for potatoes. Below 28 deg. F. changes occur in potatoes which lower the grade.

Desiccated vegetables may be stored on skids in cool dry places. These products are susceptible to attack by pests; and should be inspected frequently and fumigated as necessary, if they are not held in cold storage.

PEST CONTROL

Most green vegetables are uninjured by insects while in storage. In fact, they seldom contain as many after a few hours of holding as upon arrival, and these are seldom of storage types. About the only exception is when cockroaches get into the crates.

Rodents are the serious menace to properly stored potatoes, and may do much damage if not controlled.

Desiccated vegetables may become infested with insects, mites and rodents; and are highly susceptible to mold and fermentation when wet. They may be effectually fumigated with any gas mentioned under No. 8, FOOD INDUSTRIES, April, 1934, page 160, except sulphur; and may also be treated with either of the fumigant sprays mentioned. Mold will develop in desiccated vegetables if they become moist. Wet spots form into fermenting lumps which generally saturate the entire bag with sour, musty odors and render it unfit for use.

Meat and Fish

CONTAINERS

Ordinary grades of beef, pork and mutton are not wrapped. Higher grades are wrapped in gauze. The best grades are covered with paper-lined gauze.

Small meats such as hearts, livers and kidneys should be packed in paper-lined wooden boxes.

Cured meats (ham and bacon) are wrapped in heavy paper.

For poultry use paper-lined wooden boxes or slack-coopered barrels.

For cracklings, meat scrap, liver meal, bone meal and similar products use jute bags.

Fresh fish should be packed in ice-packed wooden boxes or barrels; frozen fish in wooden boxes.

Pickled fish is shipped in kegs.

Oysters, clams and other shellfish are shipped in wooden boxes, slack-coopered barrels or kegs.

No packing is required for lobsters, crabs or turtles, alive or frozen.

Dried fish is packed in wooden or fiberboard boxes.

SHIPPING

Meats (except cured meats) and poultry should be shipped in refrigerated carriers held between 34 and 36 deg. F., unless frozen, when 0 to 10 deg. F. should be maintained. Cured meats may be carried in clean, dry vehicles at ordinary temperatures.

Fresh, unfrozen fish and related forms, except when alive, should be shipped at a temperature between 32 and 35 deg. F. When frozen, these products require shipping temperatures from 0 to 5 or 6 deg. F. Pickled fish should be held between 32 and 35 deg. F. during transit. Dried

Nesmith Photo

Unloading Egyptian onions packed in jute bags, at the pier in Boston.

fish may be shipped in clean, dry vehicles at prevailing temperatures. Live lobsters, turtles and crabs should be held at 34 to 35 deg. F. while shipped.

STORAGE

The usual carrying temperature for unfrozen meat and poultry is 34 to 35 deg. F. When frozen, the temperature is first reduced to —6 to —18 deg., but is later held between 0 and 10 deg. F. Frozen meats held below 10 deg. F. will keep more or less indefinitely; being subject, however, to loss of weight by gradual dehydration unless sealed or frozen in ice.

At 34 to 35 deg. F. prime cuts of beef and heavy mutton may be held safely for three weeks, poultry for ten days, lambs for eight or ten days, and pork and veal for one week.

Ammonia fumes are readily absorbed by all meats, particularly when unfrozen, and this renders them unfit for food. Cured ham and bacon may be stored in a cool, dry place if protected from storage pests; otherwise they should be placed in dry, cold storage. Cracklings, meat scrap, bone and liver meals may be stored at normal temperatures, but should always be placed on skids, and not in contact with walls. These last mentioned products should also be examined frequently for infestation.

Fresh fish is regularly stored at from 32 to 34 deg. F. When frozen, the temperature is first reduced to —19 deg. F., then later held between 0 and 5 or 6 deg. F. Frozen fish have the same tendency toward dehydration during storage noticed in frozen meats. At 32 to 34 deg. F., fresh, unfrozen fish may be held safely for ten days. Pickled fish should be held at 32 to 35 deg. F. Dried fish intended for human food is best kept in ordinary cold storage to protect from insect pests. Even at this temperature rodents may attack, hence frequent inspection is necessary. Live crabs, lobsters and turtles should be held on ice or in cold storage. Imported cuttlefish, when not pickled or heavily salted, should be frozen if it is held for a long period.

PEST CONTROL

Rodents often do considerable damage to all forms of meats held in normal storage or ordinary cold storage. Usually only trapping or ratproofing can be used as rodent control measures in meat storage rooms.

Excessive surface moisture is the usual initial cause of spoilage in cured meats. Whether in cold or normal storage, moisture may collect on them when the air is humid, causing first a favorable medium for the development of mold and bacteria, which in turn cause decomposition, followed later, if in normal storage, by infestation with such pests as cheese skippers and ham beetles. When not too expensive, it is sometimes possible to salvage a portion of the articles by severely paring away the infested portions, otherwise they should be discarded. Storage mites, and several common storage beetles also attack cured meats in normal storage. These attacks usually occur, however, with long holding periods and closely packed materials. Cured meats should be suspended separately when in normal storage and should be fumigated at intervals. Ethylene oxide mixture or a similar fumigant may be used. (See previous reference to April, 1934, FOOD INDUSTRIES.)

Dried meat products in normal storage are particularly susceptible to attacks from insects, mites and rodents, and by rodents when in cold storage. They also mold rapidly when moistened. These products may be fumigated for the control of these pests with any of the gases mentioned in the previous reference except sulphur. Moldy dried meats are unfit for use and should be diverted to tankage.

Aside from dried fish, and because of their rigid storage requirements, fish usually are not molested by the larger storage pests. Dried fish in normal storage is very susceptible to

(Turn to page 156)

Beware Restrictions on TRUCKING

Motor Transport Coordinated with Rail Haulage Permits Low Inventories

By COL. C. O. SHERRILL

Vice-President, Kroger Grocery & Baking Co., Cincinnati, Ohio.

MOTORIZED transportation is increasing in importance, not only to the business interests of the country, but to the general public as well. It is particularly desirable that this fact be kept in mind at this time when the Federal Government is actively taking steps toward the coordination, under Federal supervision, of all forms of transportation. Unless the present-day necessity for motor transport is kept in mind, there is great possibility that harm may be done to all forms of transportation, and to the public interest, in the endeavor to benefit some one form. As bearing on this situation, I want to point out the place of motor trucks and trailers in the business of Kroger Grocery & Baking Co.

The great bulk of the products our organization handles is shipped at least once by railroad. In the course of a year, approximately 60,000 carloads of freight come to us by rail. This, it seems to me, makes Kroger a pretty good continuous customer of the railroads.

These railroad shipments arrive constantly at our warehouses. From these warehouses, located at strategic centers in the territories we serve, go a steady stream of motor trucks and trailers to our numerous retail stores. I am not exaggerating when I refer to a steady stream of these vehicles because we operate them 24 hours per day, with relays of carefully-trained drivers to man them. Constant movement is the very keynote of Kroger success, keeping inventories down to an absolute minimum and ever increasing turnover.

A book could be written on the countless ways in which motor trucks and trailers are being used today, in all lines of business, to help hold down inventories. There was a time, before the development of trucks, when the inventory—the stock of merchandise on hand—called for the investment of far more capital than now. Transportation was much slower and less dependable then. If chances of running short of merchandise were not to be taken, it was necessary to tie up considerable money in big inventories. This, in turn, involved a considerable element of risk because, if market prices dropped substantially, you stood to lose heavily. In fact, such market slumps in past years have put thousands of men entirely out of business.

IT IS the policy of Albert H. Morrill, president of Kroger Grocery & Baking Co., to maintain a constant movement of our merchandise. With us, warehouses are simply buildings through which foodstuffs are constantly passing—coming in on railroad freight cars and being loaded out on motor trucks and trailers. Day and night these vehicles are delivering this merchandise. The result is "mobile inventories."

With this steady movement, we achieve a turnover of about 11.4 times per year. This means that our average total investment in merchandise is moved or sold this often every twelve months. It is easy to see what this does to inventory figures.

Let me point out again that it is the coordination with railroad service of the speedy transportation service of motor trucks and trailers that has made possible this decrease in the costs of distribution.

We are not alone in this experience. Motorized haulage is responsible for effecting and insuring huge savings in the cost of doing business for thousands and thousands of other organizations in America—savings that invariably are passed directly to the buying public. It is clear that modern, motorized commercial vehicles are contributing greatly to a lower cost of doing business and, hence, a lower cost of living for all people.

Many harsh things have been said about the use of highways for commercial traffic. To the best of my knowledge and observation, however, our citizens generally have not cried out for heavier taxes and more drastic restrictions on commercial vehicles. Why should they? People today are "tax conscious" to an amazing degree; they have had their eyes opened to the fact that those who propose and demand higher taxes seldom think about from where the additional tax money is to come.

The general public now recognizes that it is the people—the great mass of us—who must pay these increasing tax bills. Never forget, therefore, that every additional tax or crippling restriction on the operation of trucks and trailers will simply result in all the people digging still more deeply into their personal pocketbooks, because tax burdens and restrictions build up the costs of distribution and must be paid for in the end by the ultimate consumers.

TRUCKS *As Advertising Media*

What appears at first glance to be a painted sign on the side of the above truck is not a sign at all, but a plate glass window through which a tray of Silvercup bread set on a table in the body interior is visible to pedestrians on the street. There is a similar window on the other side, just visible through the cab window at the front, and a third window in the rear. Other unusual features of this successful advertising truck operated by Gordon Baking Co. in Chicago are described in the accompanying text.

COMPANIES in the food field have always been conscious of the advertising value of their automotive equipment. They have striven to associate the cleanliness of their trucks with the purity of their products. This explains in part the great prevalence, at least among dairy companies, of the use of white, cream, and other light-colored paints on delivery and transfer vehicles.

It was but natural, then, that food companies should be especially receptive to the idea of using their automotive equipment as advertising media to help increase their sales, even though the equipment was used only partly, or even not at all, in essential delivery or transfer work. Two good examples of this use of automotive equipment as effective means of advertising are here described and illustrated.

The first concerns a company in the baking business, the Gordon Baking Co., using a purely advertising truck, and the other, the use of special delivery vehicles made up in the shape of milk bottles by dairies in widely different parts of the country.

The Gordon truck pictured is operated in Chicago, although the company has a similar vehicle in service in Detroit, where it also has a large bakery. The truck shown is a 3½-ton Reo carrying a panel body featured by two large plate glass windows, one on each side, with a third window in the rear.

The interior of the body is fitted up as a reception room with a table set for service with a vase of flowers; drinking glasses; knives; forks; spoons; plates and a tray of the company's Silvercup bread. The room also has a rug on the floor; a lamp and four chairs with the interior decorations done in the Martha Washington style. All of this may be seen by pedestrians on the street through the side and rear windows.

The truck is also fitted with a complete amplifying system with facilities for reproducing radio programs and phonograph records. The sound apparatus also includes a microphone, so that a person speaking inside of the body may have his voice amplified through the four large Racon horns located on the body roof, as shown in the accompanying illustration.

The power for the operation of the sound apparatus and for lighting the body interior is furnished by a 2-kw. generator driven by a four-cylinder Ford engine carried inside the body. There are 84 red, white and blue electric lights inside the body and these are so wired and controlled that they can provide colored lighting effects which may be seen from the outside through the body's three windows.

None of the company's products is carried in the truck except the tray of bread on the table, as previously mentioned. It, therefore, plays no part in the company's delivery scheme and is admittedly essentially an advertising medium, the results of which were considered so satisfactory that a second unit of the same kind was subsequently put into service in another city.

The equipment is employed in three different ways. It may be used for ordinary street advertising, with the truck stationary or in motion, the sound apparatus meanwhile reproducing and amplifying radio programs, phonograph records, or the voice of an employee announcer inside the body. Secondly, it may be used in day or night parades with similar sound reproduction.

A third effective use of the truck is at large outdoor gatherings such as mass meetings or picnics. Guests or officials may enter the reception room comprising the main portion of the body interior to make announcements or short addresses and in this manner build up good will for the company's products.

THE other type of advertising truck, the milk bottle on wheels, combines with its advertising value, some utiltiy, since it is used as a special delivery vehicle and can carry a load of from nine to fifteen cases, depending upon how the interior space behind the driver's seat is partitioned off and how large a body is provided.

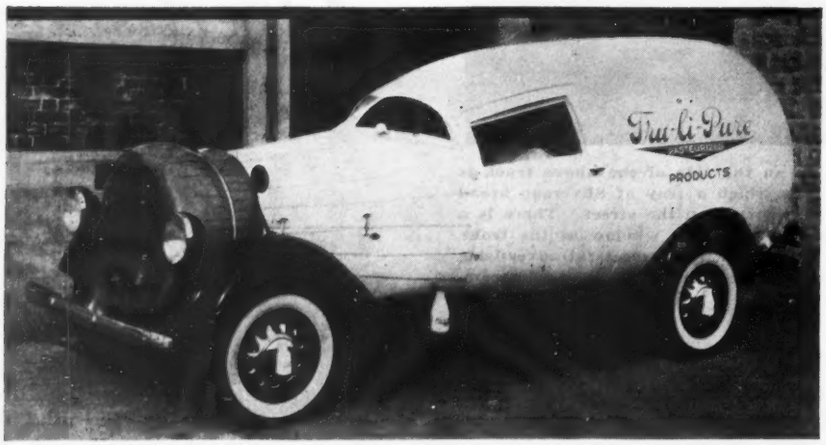
One of the first of this type of vehicle to be put in service was that owned by the Borden's Farm Products Co., Inc., New York City. It was introduced coincident with the company's presentation of a new brand of milk, called "Golden Crest." That milk is delivered in a glass bottle bearing a shield surmounted by the figure of a cow, together with the words "Golden Crest," all in a golden

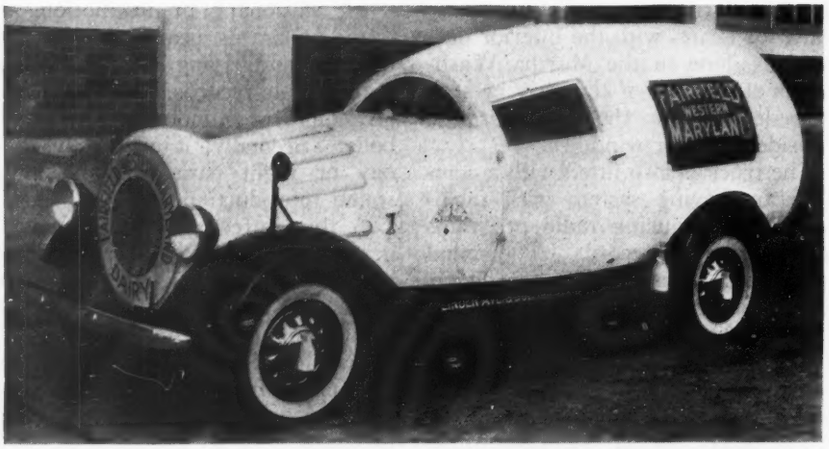
color. These are reproduced in the same color in the body lettering and in addition, to carry out the color scheme, the four fenders of the truck are painted a golden color.

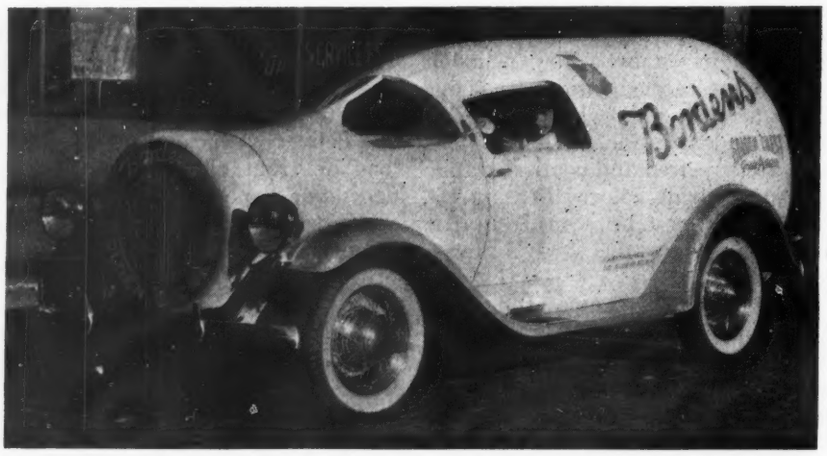
At this writing the Borden company has a fleet of six such milk bottle trucks under construction and plans to rotate them in service at all of its 50-odd retail branches in the Metropolitan New York area. Each body is mounted on a Ford 131-in. wheelbase chassis and carries the equivalent of approximately nine quart cases of milk.

The body of the first of the Borden Golden Crest milk trucks was built by FitzGibbon & Crisp, Inc., Trenton, N. J. Its construction presented more of a problem than one might imagine from looking at the finished product. It was necessary to faithfully reproduce the proper proportions of the bottle in length, diameter and size of cap. These proportions had to be secured and yet not interfere with the essential operating parts of the chassis, including the radiator, engine, steering wheel, and at the same time provide adequate vision for the driver for safe operation on the road.

In the FitzGibbon & Crisp body these were worked out to the last detail, including curved glass in the windows in the driver's compartment. The shape of the two-part windshield was especially difficult to work out for driver vision and yet not distort the shape of the neck of the bottle at that point. The shape of the bottle cap takes the form of a false front enclosing the regular Ford radiator, which is not changed in any respect except for the removal of the shell.







Milk bottles on wheels have become quite popular in recent months as a means of making the public milk conscious. Above are shown three examples of the truck body builder's art in reproducing a milk bottle with sufficient vision for the driver to permit safe operation over city streets. At the top is one such vehicle used in Nashville, Tenn.; in the center, one employed in Baltimore, Md., and at the bottom, one operated by Borden's in the Metropolitan New York area.

THE other two milk bottle trucks pictured herewith were made by the Theurer Wagon Works, Inc., New York City. One is in the service of the Nashville Pure Milk Co., in Nashville, Tenn., and the other is seeing service in Baltimore, Md., for the Fairfield Western Maryland Dairy. Both are mounted on Dodge light truck chassis. The same bodybuilder also has under construction a fleet of similar milk bottle trucks for Sheffield Farms, doing business in the New York City area.

The two Theurer bodies shown are essentially the same except for the shape and painting of the caps and the markings on the bottle necks. In each case the bottle of the purchasing dairy is reproduced as faithfully as possible down to the smallest detail.

One of the featured details is the special hub cap, made of a special bronze casting carrying in relief the shape of a milk bottle, also painted white. Another is the side running light, made in the shape of a milk bottle with an electric light bulb inside.

Straight glasses are used in the doors of the driver's compartment and in the windshield, which is in the shape of a segment cut straight across the neck of the bottom with a strip of metal extending from the top of the windshield at the center forward to the relatively straight portion of the bottle neck. A hinged rectangular-shaped door is provided in the neck of the bottle to give access to the truck engine for adjustment or repair.

Practical Problems of

TRUCK TRANSPORTATION

DISCUSSED BY EXECUTIVES IN THE FOOD INDUSTRIES

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What Is the Best Way to Maintain Finish On Truck Bodies?

Question No. 7

1. On what types of bodies used on trucks in the food field is it preferable to use wax instead of washing and polishing in the usual manner?

2. Does the waxing preserve the finish so that repainting may be done less often?

3. When repainting has to be done, how is the wax remaining on the body removed?

4. How often must rewaxing be done?

5. For the maintenance of a given character or degree of finish, does it cost more to wax and rewax than to wash with soap and water and polish with chamois?

Uses Water Washing

WE maintain the good appearance and lasting qualities of the finish on our trucks by washing and using a product known as "Tri-Solvent" with the wash water. This leaves the truck bodies glossy with no further polishing.

We are unable to give you any information concerning the use of wax as we do not use the waxing method.

When repainting becomes necessary, we wash our truck bodies with benzine, sand the surface, and repaint. One has to use his judgment as to how often to repaint.

We find the washing method quite economical to keep our truck bodies in neat and clean condition simply by washing, as described above, yet we have no available figures by which to make a comparison with the waxing method.—ALEX JOHNSON, *supervisor of plant operation, Land O'Lakes Creameries, Inc., Minneapolis, Minn.*

Favors Water Washes

OUR experience regarding the best course to follow in maintaining the finish on truck bodies is as follows:

1. Only on small vehicles such as sedan deliveries or coupes should wax be used. Light colors, white or light yellow, should be washed instead of waxed. Wax tends to discolor light paint.

2. Wax preserves the finish but the cost of cleaning vehicle and applying wax is high.

3. Wax can be removed by the use of high test gasoline or "Autobrite" lacquer cleaner.

4. Rewaxing should be done every four to six months, depending on the type of service in which the vehicle is used.

5. Frequent washing is the cheapest method of keeping a vehicle clean and fresh-looking.—PAUL E. FERBER, *Hoffman Beverage Co., Newark, N. J.*

Borden Favors Water Washing

THE produce division of The Borden Sales Co., Inc., New York City, has given serious consideration to waxing the panel bodies of its refrigerated retail delivery trucks and has decided to retain its present method of water washing, at least until more convincing records of both cost and performance are available.

It is our opinion that the waxing of panel bodies is much more expensive than power washing with water; that greater surface finish life is problematical and that a decision to wax bodies necessitates a maintenance procedure which is very difficult to control under decentralized operations in widely scattered cities with the trucks stored in public or semi-public garages.

In its retail delivery work, Borden's produce division operates from four to eight trucks in each of approximately fifteen different cities. In each city, the number of trucks in service is not sufficiently large to warrant a company-owned garage or to maintain a company mechanic. Hence our trucks, which are standardized Fords to our own specifications, are serviced under a rigid inspection system by local Ford dealers and stored in conveniently located public garages. In these, water washing is the rule rather than the exception, and facilities and experienced washers are available.

To wax bodies on trucks operated under such conditions as above outlined would require a control which would be difficult to maintain. Ladders or some form of platforms would be necessary to properly wax the upper portions of the bodies in order to prevent the labor cost of waxing from becoming excessive.

We use as little soap as possible on our bodies which are finished with a coat of clear varnish to protect the lettering. When this finish shows signs of wear, we sand it down and recoat it. Extreme fluctuations in temperatures during body washings are to be avoided. For example, if a truck operated on the streets at temperatures of from 10 to 20 deg. F. or lower is run into a a heated garage at 50 to 60 deg. F., it should not be immediately washed but should be allowed to stand in order for the paint to take the temperature of the garage and then washed in luke warm water. Hot water sprayed on a cold body tends to crack the varnish.

Should bodies with cracks in the varnish be waxed, the use of wax has been known to discolor the paint, especially if the latter is of a white or other light color.—Jos. HUSSON, *Automotive Superintendent, The Borden Sales Co., Inc., Produce Division, New York City.*

Uses Aluminum Paint and Lacquer

WHILE we have had no experience with wax, we will look forward with interest to the issue of FOOD INDUSTRIES in which the experience of others in this connection will be published. We are having a new body delivered in the near future. This body will have a factory paint job and in line

Next Month's Question

QUESTION NO. 8

What is the best method of determining the cost of distribution by trucks?

1. What kind of truck cost records can be justified?

2. Does it pay to keep individual truck cost records?

3. What is the clerical cost per truck per year for keeping individual truck cost records?

4. Are group costs less expensive and just as effective as individual truck cost records?

with your questions, will try waxing it, and send you at a later date, the results of our experience.

At the present time we use on our panel bodies an aluminum paint covered with a coat of lacquer. We find that this finish stands up well for at least a year in spite of the fact that we do not have entirely satisfactory facilities for washing in bad weather. We have also found that Wyandotte detergent used to remove grease and stains is not detrimental to the paint.—A. V. GEMMILL, *Town Talk Ice Cream Co., Morristown, N. J.*

Waxing Adherent

IT has been our experience that it is desirable to wax our panel bodies with metal sides. We consider it most important to wax the engine hood and cab immediately after repainting. This course seems to preserve and brighten up the hood paint which nominally loses its luster first because of the heat transmitted from the engine operation.

We also feel, according to the experience of Daniel J. Leary, who is in charge of our automotive transportation, that waxing of our metal bodies helps to preserve the finish so that repainting may be done less often. We wax our bodies once every three months.

Also we do not believe that it costs more to wax our bodies as above outlined than to wash and polish them with water and chamois in the regulation manner. When a body is ready to be repainted, we remove the wax by rubbing with sandpaper. — JOHN J. MULLIGAN, *secretary, Diamond Bottling Corp., Waterbury Conn.*

Prefers Polish Over Wax

WHILE we have experimented to some extent with a wax polish for maintaining the finish on truck bodies, we have found that unless the wax was removed, after several applications it had a tendency to build up and form a film over the enamel. On a white job such as ours, this film changes the white to a light cream color. Also, when it was necessary to touch up or repaint the vehicle, the wax had to be first removed with gasoline.

We are now using very successfully a polish composed of a gum compound. This is also a preservative that prevents chalking and thereby prolongs the life of the enamel.

After streaks have once been removed, we have found our equipment to be in better condition over a period of time than was the case when we were using soap and water. This is especially true in the winter months when it is practically impossible to wash because of low temperatures.—E. B. CLARK, *paint superintendent, Borden's Farm Products Co., New York, N. Y.*

Kansas Dairy Prefers Waxing

WE have found it desirable to use wax on our truck bodies because it preserves the finish so that repainting has to be done less often. In repainting, we always remove all the paint and the wax is taken off with it.

The necessity for rewaxing depends to a large extent on weather conditions. We usually rewax our truck bodies twice a month. We find it more expensive to wax and rewax than to wash with soap and water, and give a final chamois polish.—ARTHUR FRITZELL, *Fritzell Dairy Products, Lawrence, Kan.*

Another Water Washer

I AM sorry that I am unable to give you the information desired on washing versus waxing, as our company does not wax the bodies of either trucks or wagons.—EDWIN A. KAYSER, *vice-president, St. Louis Dairy Co., St. Louis, Mo.*

Size of Food Manufacturing Plants

Indicated by Income Tax Returns, 1932

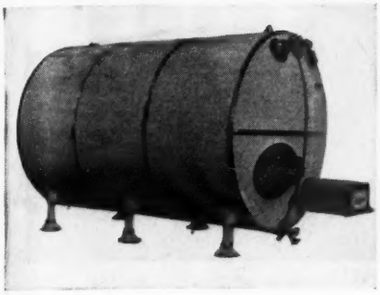
(From Statistics of Income, 1932, U.S. Treasury Dept.)
(Money figures in thousands of dollars)

Total assets classes	Number of returns with balance sheets	Cash,[1] notes, and accounts receivable	Inventories	Capital assets (less depreciation)	Total assets—Total liabilities	Notes and accounts payable	Bonded debt and mortgages	Capital stock: Preferred	Capital stock: Common	Surplus and undivided profits less deficit	Gross sales[2]	Gross receipts from operations[3]	Total compiled receipts[4]	Compiled net profit or deficit[5]	Statutory net income or deficit	Cash dividends paid
Manufacturing: Food Products Including Beverages—Returns Showing Net Income																
Under 50	1,294	7,093	3,288	16,418	29,934	5,898	1,349	555	17,707	2,678	70,165	2,587	73,373	2,600	2,582	1,839
50-100	604	10,006	4,829	24,833	44,745	6,994	2,431	1,584	23,487	8,151	74,132	1,946	76,812	2,869	2,826	1,978
100-250	660	23,120	11,823	54,130	102,765	14,360	6,397	6,953	53,427	18,006	151,404	2,822	155,898	6,008	5,885	3,552
250-500	361	25,511	16,828	64,301	127,326	13,880	8,122	13,159	49,543	38,325	178,737	4,199	184,766	8,531	8,239	5,529
500-1,000	200	30,565	20,120	62,008	139,216	13,669	6,026	11,633	54,516	45,880	186,761	1,699	190,578	11,309	10,827	6,679
1,000-5,000	199	78,419	60,537	164,451	404,800	34,220	19,442	52,031	136,347	145,595	419,361	12,768	438,092	24,281	22,897	17,169
5,000-10,000	35	43,574	31,782	109,092	243,010	10,534	14,851	31,574	97,331	80,302	197,796	18,005	219,996	16,272	15,113	11,901
10,000-50,000	37	123,338	96,667	312,484	766,494	42,474	41,549	105,250	283,613	246,451	715,762	15,263	744,293	49,740	43,562	40,215
50,000 and over	15	375,950	184,260	728,734	1,761,705	138,695	203,647	346,230	632,005	356,036	2,267,500	11,406	2,337,913	96,694	86,950	123,040
Total	3,405	717,576	430,133	1,536,452	3,619,994	280,723	303,813	568,969	1,347,976	941,424	4,261,618	70,695	4,421,721	218,305	198,881	211,903
Manufacturing: Food Products Including Beverages—Returns Showing No Net Income																
Under 50	5,166	19,533	12,872	57,771	103,150	34,767	8,543	3,624	73,412	[7]26,330	186,405	4,904	192,655	[7]16,979	[7]17,018	432
50-100	1,654	21,390	14,101	63,514	117,589	32,902	9,511	7,390	73,835	[7]14,545	153,709	1,744	156,763	[7]12,089	[7]12,140	467
100-250	1,504	40,887	31,250	126,342	235,583	55,006	22,240	20,699	127,010	[7]2,694	272,633	3,713	279,211	[7]21,412	[7]21,585	1,321
250-500	599	32,779	25,858	106,426	206,370	39,328	18,950	18,288	104,575	15,487	206,133	2,764	212,766	[7]14,894	[7]15,245	1,394
500-1,000	316	35,163	31,736	109,267	217,694	37,810	19,530	26,170	99,681	24,416	210,127	2,995	216,340	[7]14,015	[7]14,367	1,542
1,000-5,000	255	76,258	65,061	278,214	539,690	64,674	72,266	85,693	219,153	71,353	404,150	10,829	423,961	[7]27,650	[7]29,047	6,813
5,000-10,000	38	29,981	21,534	146,091	265,328	36,120	49,679	46,906	94,185	27,207	119,668	4,831	130,751	[7]15,758	[7]16,847	1,002
10,000-50,000	44	98,408	102,201	438,401	899,453	85,653	150,629	102,240	361,749	149,719	397,304	21,517	432,189	[7]58,384	[7]61,020	6,706
50,000 and over	4	161,034	97,625	183,930	612,583	101,969	98,491	67,001	212,201	83,106	753,812	5,892	784,210	1,043	[7]13,928	39
Total	9,580	515,434	402,239	1,509,955	3,197,441	488,229	449,840	378,011	1,365,802	327,720	2,703,940	59,189	2,828,847	[7]180,139	[7]201,197	19,716

[1]Includes cash in till and deposits in bank.
[2]Gross sales where inventories are an income-determining factor.
[3]Gross receipts from operations where inventories are not an income-determining factor.
[4]Includes net profits from the sale of capital assets (real estate, stocks, bonds, etc.) but not gross receipts from these items. Exclude nontaxable income, other than interest on tax-exempt obligations and dividends on stock of domestic corporations as reported in schedule L of the return.
[5]Compiled net profit or deficit is total compiled receipts less statutory deductions.
[6]Classes grouped to conceal data reported and identity of corporation.
[7]Deficit.

NEW EQUIPMENT

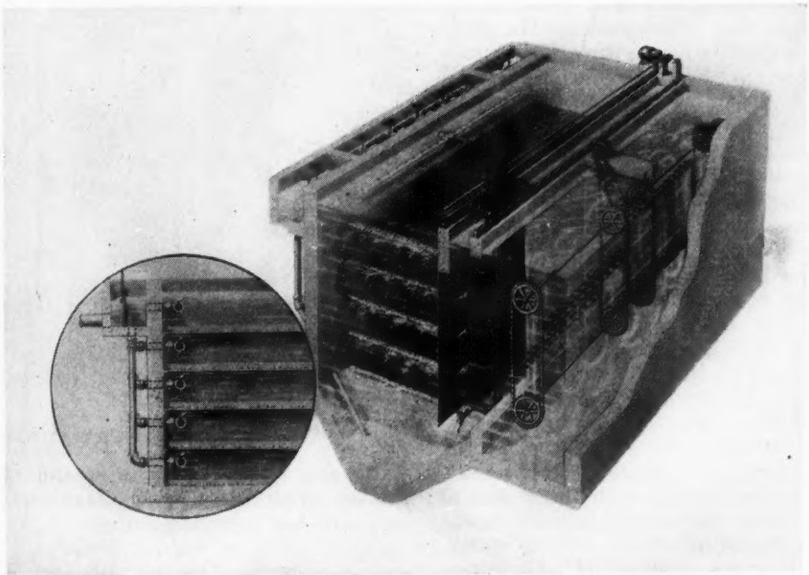
for Food Manufacturers



Milk storage tank.

Milk Storage Tank

GLASS-LINED storage tanks for milk with "Stream-Flo" agitation are a new development of Pfaudler Co., Rochester, N. Y. The agitator is designed along lines of propulsion developed in the aviation industry and is said to produce straight-away currents rather than the wide turbulent action formerly obtained with marine-type propellers. Small blades, operating at double the speed previously used, cut power consumption in half. The milk is thus moved effectively, but is not subject to violent agitation or beating that will cause foaming. The agitator is driven by V-belt drive. Drive is inclosed in an aluminum case which serves as a combination platform and step. The bushing through which the agitator shaft passes is demountable and easily cleaned. Peephole and light fixtures are also easily removable for cleaning.

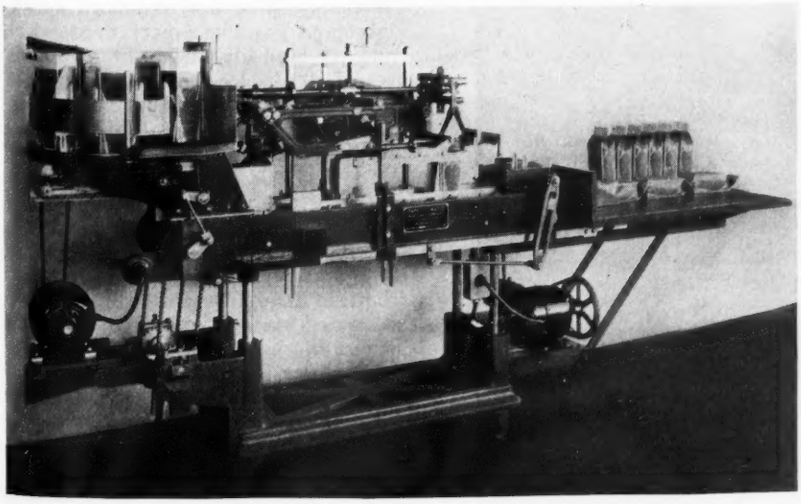


Phantom view of settling equipment.

Settling Equipment

FOR PURIFICATION of water and treatment of industrial wastes, the "Super-Settler" has been developed by International Filter Co., 59 East Van Buren St., Chicago, Ill. The design feature of this equipment is a series of horizontal settling compartments, one above the other, placed in a concrete or other settling tank of conventional design. These compartments all receive an equal flow from a common inlet canal at one end. Inlets are at bottom of compartments. Outlet pipes are at top of opposite ends of compartments. Between the two, settling occurs. Means are provided for rapid sludge removal.

It is said that this design requires only one-third the space for a given job, when compared to other available equipment. This is brought about by the positive control of flow made possible by the design.



Bag closing and "Tin-Tie" clinching machine.

Bag Closing Machine

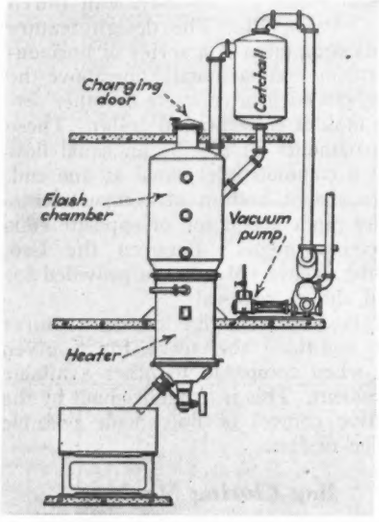
FOR closing paper bags using the standard "Tin Tie" method of sealing, Tape-O-Matic Machine Co., 50 Columbia St., Newark, N. J., has developed its "Model T" machine. This machine may be synchronized with weighing and filling machine rates of 20 to 30 finished bags per minute. It is fed directly by scale operator without rehandling.

In operation, the machine vibrates the filled bags to desired compactness, closes the top and clinches the ends of the "Tin-Tie" securely. The machine is fully adjustable, and is portable, being mounted on casters. It occupies a floor space of 8½ x 2 ft. and weighs 800 lb.

Truck Refrigeration

AIR CONDITIONING and refrigeration for trucks is supplied by Century Electric Co., St. Louis, Mo., through the Whitaker-Upp "Electric Power System." The equipment consists of a 115 volt, constant voltage d.c. generator, driven by V-belt from engine crank-

Rendering unit of the Lowry or circulating rendering system.



Arrangement of equipment in the Lowry rendering system.

shaft, a Century dual motor for operating the refrigerator compressor, and the evaporator fan motor. Current from the generator passes through relays and protective devices to the d.c. end of the motor. While the truck is in the dock with the engine stopped, the a.c. end of the dual motor is plugged into the 110 or 220 volt house current and refrigeration continues, while the d.c. end of motor can be used as a generator for operating the evaporator fan motor.

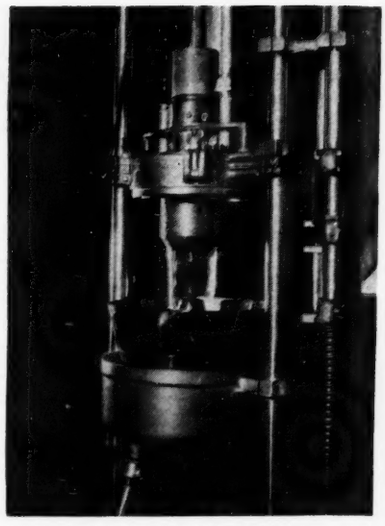
Lard Rendering

OVER five years of development work on plant-size equipment are said to have gone into the new rendering equipment called the Lowry system, now being offered by Darling & Co., Chicago, Ill. The operation of the equipment, using steam at 220 deg. F. as a heating medium, is based on the rapid circulation of the material, while under a vacuum, through the unit shown in the accompanying illustrations. The only moving part is the worm, which causes the lard to pass upward through the central tube of the lower, or heating portion of the unit. The material passes down again through the group of concentrically arranged triangular tubes. Heating is done with steam at 1 to 5 lb. pressure in jackets around this part of unit.

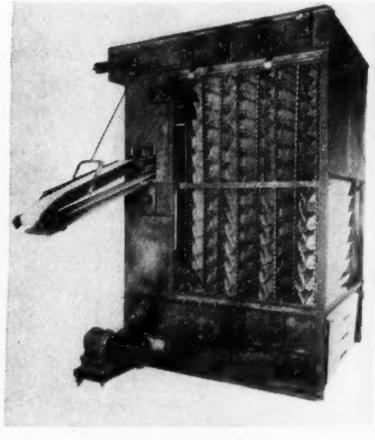
Above the heating chamber of the unit is a flash chamber in which the vapor is separated from the liquid. Vapor is drawn from this chamber by means of a vacuum pump, passing through a "catchall" which separates liquid from vapor. A vacuum of 26 to 28 in. is employed.

Charging of a ground material is accomplished through a charging door at top of unit. Rendered material is drawn off at the bottom into a settling tank.

Advantages claimed for this equipment are improved flavor and color of products because low temperature prevents scorching; accurate control of process; high throughput; easy operation; and low operating cost.



Thin-film milk irradiator.



Day loop proofer.

Gasoline Tiering Truck

FOR USE with the "pallet system" of storage, Elwell-Parker Electric Co., Cleveland, Ohio, has developed a new, high-speed gasoline power tiering fork truck, or high-lift truck with a capacity up to 7,000 lb. load and speed up to 12 miles per hour. This truck uses a four-cylinder standard motor of 33 brake horsepower at 1,250 r.p.m.

The truck is designed for the use of a ram, or two or more forks, and other accessory attachments that enable it to pick up any kind of a load on pallet or skid. Large crates or rolls can be lifted from the floor, transported in tilted position and stacked without the operator leaving his position.

Elevation is by oil pressure from a hydraulic pump. The lowering valve is manually controlled. Fork movement can be stopped at any point of travel. Tilting is also by hydraulic power, through a ram controlled by levers. Transmission safety-lock is provided to hold the truck in position on ramps.

Gasoline tiering truck.

Milk Irradiator

BASED on the principle of short exposure of thin milk films to ultra-violet light, for the purpose of developing vitamin D potency, Cherry-Burrell Corp., 427 West Randolph St., Chicago, Ill., have recently placed on the market an irradiating device for use by dairies. The accompanying photograph shows the irradiator with its water film in place, but without the milk film, which is located outside, and surrounds the water film. In the center can be seen the carbons of the arc, which have a motor-controlled feed.

The water film around the arc, about .008 in. thick, is gas-tight and serves as a chimney for the fumes of the flaming arc, an exhaust fan insuring fume removal. Surrounding this water-film chimney, the milk film, also .008 in. thick, issues from a slot 8¼ in. in diameter. The milk is thus exposed to the ultra violet light for but a fraction of a second, as it flows swiftly by.

A pressure of 3 lb. per sq.in. serves to move the milk through the irradiator. As the milk issues from the metal slot, it not only moves downward, but also in a rotary direction. This generates a centrifugal force which makes possible the maintenance of the thin-walled cylinder of milk by overcoming the surface tension effect which would otherwise contract the cylinder into an inverted cone.

Capacity is controlled by a positive feed pump, and for standard vitamin D potency is 4,000 lb. per hour.

Loop Proofer

AN automatic proofer that is said to produce superior results in the finished loaf of bread has recently been placed on the general market by J. H. Day Co., Cincinnati, Ohio, after about two years of experimental operation in selected bakeries. The advantages claimed for this design spring from the rolling of the individual loaves in canvas loops.

In operation, the dough passes through divider and rounder, as usual, and then into the proofer for the customary period of rest and secondary fermentation. Here each individual loaf is automatically placed in a canvas loop suspended from the conveyor chains. As it passes along through the proofer toward the exit, it receives the required resting period under conditions of controlled temperature and humidity. At the same time, the action of the canvas loop rolls and elongates the dough, putting it in better shape for the molding machine. During this process, the dough is partially covered for about ½ of the proofing time. All of these actions are gently performed, so that the dough received the proper period of rest. At the same time the entire skin of the loaf is kept moist.

Day loop proofers are available in eight sizes, with capacities from 412 to 1426 loaves and motors from 1 to 3 hp.

High Pressure Pump

FOR plants that clean equipment with high pressure water, a pump called the "Hydropress" has been developed by Byron Jackson Co., Berkeley, Calif. It is of centrifugal type and operates at pressures up to 2,800 lb., the stages numbering from 4 to 54, depending on conditions. Four standard sizes are available: 8 in., 10 in., 12 in., and 15 in., with capacities from 10 to 250 gal. per minute.

Protected Motors

NEW "Seal-Clad" squirrel cage motors introduced by Allis-Chalmers Mfg. Co., Milwaukee, Wis., embody a permanent coil protection. Shields of "Bakelite" are sealed over the stator coils to protect against dust, grit, oil, moisture, mild acids and other agents injurious to insulation. These motors are available in ratings up to 25 hp. and 1800 r.p.m.

Medium Heavy Truck

FOR all general hauling purposes, White Motor Co., Cleveland, Ohio, announces a new medium heavy duty truck, Model 718. This truck has a gross rating of 20,000 lb., with a wheelbase range from that of the tractor at 130 in., in 18 sizes up to 190 in.

The engine is of six-cylinder type, developing 90 hp. at 2,800 r.p.m. Five-speed transmissions are available. Brakes are hydraulically operated with vacuum booster, or air brakes may be supplied. Radiator and fenders are of streamline design.

The Manufacturers Offer...

Ammonia—Safety practices in handling ammonia cylinders, emergency measures in case of ammonia leaks, and curve showing ammonia pressure - temperature relations are included on a linen wall chart now being distributed by Mathieson Alkali Works, 60 East 42d St., New York, N. Y.

Yeast Culture—Propagator for pure yeast cultures described in a pamphlet by Schwarz Laboratories, Inc., 202 East 44th St., New York, N. Y.

Capacity Calculator—For vertical cylindrical tanks, 3 to 20 ft. diameters, 2 to 10 ft. height of liquid, distributed by General Tank Corporation, Kearny, N. J.

Beer Filters—Made by Seitz Works, Germany and sold in the United States by Philipp Wirth, Inc., 31 Union Square, New York, N. Y., described in illustrated catalog.

Stainless Pipe — Seamless, heat-resisting pipe and tubes of stainless steel, for food plants and dairies, are described in a new illustrated folder published by National Tube Co., Pittsburgh, Pa.

Pneumatic Conveying—By the "Airveyor" system, for grains and other fine or granular food materials. Described in an illustrated catalog by Fuller Co., Catasauqua, Pa.

Copper Piping — Streamlined copper pipe and fittings for food plants discussed by Mueller Brass Co., Port Huron, Mich., in an illustrated bulletin.

Brewery Equipment—For manufacture, refrigeration, power and water supply. Bulletin WP-1069, Worthington Pump & Machinery Corp., Harrison, N. J.

Mixers and Agitators—Of the "Lightnin" line, are the subject of new illustrated catalog of Mixing Equipment Co., Inc., Rochester, N. Y.

Switchgear — Catalog No. 8, switchgear, Roller-Smith Co., 233 Broadway, New York, dealing with control panels, switch houses, cubicles and metal clad units.

Tire Calculator—For determining the tire combination necessary to carry a given load on a truck in the 1½-ton class, B. F. Goodrich Co., Akron, Ohio, has designed a calculator of the slide rule type.

Can Literature—Distributed by the American Can Co., 230 Park Ave., New York, N. Y., includes "The Story of the Tin Can," "The Canned Food Handbook," and "What's in a Can?" (the latter being reprints of recent advertisements).

Pyrometers—Type JR, for industrial use, made by Thwing Instrument Co., 3339 Lancaster Ave., Philadelphia, Pa., described in leaflet A-3410.

Rust Resistance—Steel, for anti-corrosion service, discussed in a new folder of Republic Steel Corp., Youngstown, Ohio, dealing with "Toncan" iron. Also, by same company, "Sheet Iron—a Primer," a booklet describing the development and use of rust-resisting steel sheet.

Plant Roofs—Bonded asbestos roofing for industrial plants is the subject of a new illustrated brochure published by Johns-Manville, 22 East 40th St., New York, N. Y., entitled "What About Your Roofs?"

Remote Control—For temperature, pressure, level and other conditions to be controlled from distances of a few feet up to several thousand miles, Bristol Co., Waterbury, Conn., describes the "Metameter" in Bulletin No. 424.

Refrigeration and Cooling—Three new publications, by Frick Co., Waynesboro, Pa.: Bulletin 530-A, refrigeration for use on shipboard; Bulletin 154-B, milk cooling cabinets and refrigerating units; Bulletin 140-A, refrigerating machine oil.

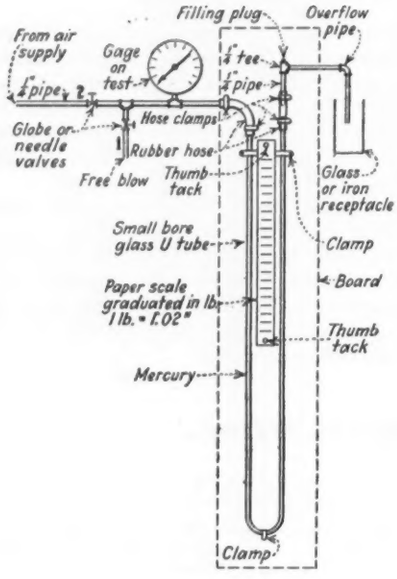
Portable Mixer—The "Typhoon," portable mixer made by Patterson Foundry & Machine Co., East Liverpool, Ohio, described in a new bulletin.

Canning Machinery—The full line of canning machinery and supplies, made by A. K. Robins & Co., Inc., Baltimore, Md., in a new general catalog, and a supplemental catalog dealing with the "Tuc-Robins" line of whole grain corn canning machinery.

Refrigerating Machinery—For dairies, food plants and general service, Catalog V-99 illustrates and describes the refrigerating equipment made by Creamery Package Mfg. Co., 1243 W. Washington Blvd., Chicago, Ill.

Equipment Cleaning—The use of sodium metasilicate in solution for cleaning equipment in the meat packing industry, discussed in a new booklet by Philadelphia Quartz Co., 121 South Third St., Philadelphia, Pa.

IDEAS . . . FROM PRACTICAL MEN



Testing Gages for Low Pressures

THE accuracy of pressure gages is often a major factor in process control. To secure uniformity of product it is necessary that control gages be checked periodically. The usual methods of checking are not as a rule satisfactory for those gages having the lower scale ranges, so often used either alone, or in conjunction with a thermometer to control heating processes.

An inexpensive device for the calibration of low scale range gages is shown in the sketch. Consisting of a glass U-tube, mercury, and a suitable scale, it affords a simple means of checking pressure by comparison with the height of mercury column the pressure will support. One pound pressure will support a column of mercury 2.04 in. in height. As the depression below the zero level of mercury in the U-tube is equal to the elevation in the opposite leg, a scale having graduations of 1 lb. = 1.02 in. is used.

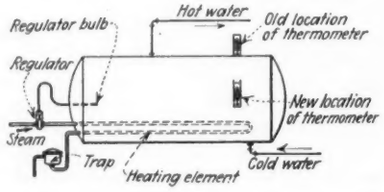
When testing a gage the following procedure should be adhered to (reference figures as on accompanying sketch);

1. Open valve (1) wide. Valve (2) should be closed.
2. See that O point on scale is at exact level of mercury in both legs of U-tube.
3. Open valve (2) one turn.
4. Throttle valve (1) until desired pressure is obtained. Care should be used at this point to avoid blowing mercury out of tube into overflow receptacle. With a little experience the operator will be able to adjust valves to obtain any pressure within the range of the U-tube.

Caution—Any water on top of the mercury will give a false reading. If water is present, mercury should be blown over into overflow receptacle, dried with a rag or blotting paper, and then replaced with a funnel through opening provided for filling U-tube.

A few hints will be useful when building the device.

1. Use small bore thick walled glass tubing—the smaller the bore the less mercury required.
2. Use only iron piping on overflow line.
3. Use only pressure hose. If laboratory tubing is used, reinforce with wire wrapping or friction tape.
4. In the absence of a U-tube of the desired length, length may be secured by joining several pieces of glass tubing with rubber hose.—S. H. Coleman, Waynesboro, Va.



Thermometer Location

IT IS customary to install thermometers in hot water heaters and other similar vessels on the top of the tank. This is done because the liquid rises when heated. But instead of being a reason for putting the thermometer in that location, it is really a reason for putting it elsewhere.

This will be appreciated from an examination of the accompanying sketch. Assume at any given instant that the heater is completely filled with hot water and the temperature regulator is set for 180 deg. F. If hot water is being withdrawn faster than heat is supplied, the water will start getting cold from the bottom, but the thermometer will indicate correct temperature until the heater gets cold clear to the top. It is then too late to do anything about it. This is to say, a thermometer installed at the top does not serve the purpose for which it was placed there, namely, to give warning, for when it does warn the tank is already cold.

In one plant that I have in mind, the normal hot water requirements could be met with a boiler pressure of about ½ lb., but during periods of heavy demand higher pressures were necessary. Since heavy demand for hot water was infrequent, only two or three times per month, the normal pressure was carried at ½ lb., and each time the demand went up the hot water failed and there were many complaints. It will be noted that the bulb for the steam regulator was properly placed. Also, it opened at the right time. However, since the steam pressure was inadequate, the hot water kept getting colder while the attendant had no warning of the condition until the temperature started to fall in the thermometer on top. It was then too late to increase the steam pressure and thus prevent the hot water supply from giving out.

This trouble was corrected by placing the thermometer at the same level as the regulator bulb. Then, when the hot water demand went up, warning was given in ample time to change the pressure on the steam valve and keep the heat up.—N. T. Pef, Chicago, Ill.

Portable Dry Mixer

THE bulk of the finished product in the baking powder plant of the Rumford Chemical Works is standard and is handled by a highly developed system of handling machinery. However, there are times when

it is necessary to turn out some special mixture for certain customers and special means must be provided for doing this.

The equipment developed for this purpose consists of a large wooden box with a skid bottom, so that it may be moved when and where desired by means of an electric lift truck. This box is hinged to its skid base at one end so that it may be tilted in order that the materials in it may be discharged through a door in the bottom. The lift trucks used in this plant are of the type in which the carrying platform may be raised about 5 ft. By putting one end of this lift platform under the free end of the box, it is an easy matter to tilt it up. It is then held in position by a rod on the box which fits into notches in an upright framework.

This homemade equipment has proved an admirable answer to the problem met in this plant, and would undoubtedly serve many other purposes.—F. A. Westbrook, Center Conway, N. H.

Hopper Linings

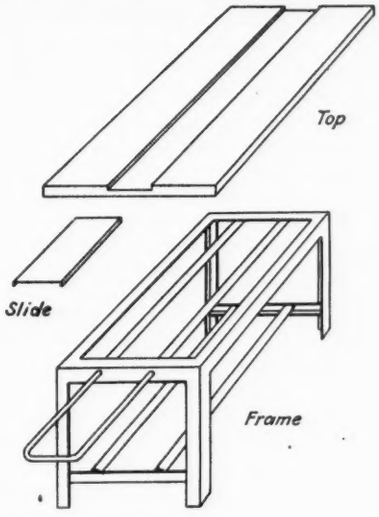
CORN STARCH is not a particularly easy product to package accurately, because of its tendency to hang up in the hopper of the filling machine. This situation is not always helped by putting an agitator into the hopper, especially in those cases where the package is filled by weight and not by volume. Believing that static electricity had some influence in the phenomenon, the ingenious manager of a Mid-Western plant lined hoppers of his weighing scales with fibreboard, similar to that used for binding children's notebooks. Whether the theory was correct or not, the trouble ceased and the material hung up no longer. One of the interesting features of this experiment was that the paper utilized was by no means smooth. One would assume after feeling it that it would have an opposite effect.

Lining a hopper with parchment is a useful trick, especially when the material is sticky and difficult to remove from the machine. In cases where the same filling machine is used for filling many different products, this trick comes in handy.

Cream Denaturant

A LARGE creamery has been using erythrosine, a certified food color, for coloring condemned cream. They have found, by making comparisons of various blues, reds, greens, purples, etc., that this color did not fade, but became more pronounced as the cream aged.

Erythrosine costs $17 per pound and it takes one gram to color ten gallons of cream. There are 454 grams in a pound, so it costs 3.74 cents to color ten gallons.



Wrapping Table

FOR wrapping brick ice cream, a specially designed table has proved to be of exceptional merit. Six operators may work at it at one time, although but two are shown in the accompanying photograph.

Cream comes from the cutter on a board and is placed in the center channel and slid by the operator to the wrappers. The advantage of the center channel lies in controlling the drip and avoiding soiled wrappers. The table top is 7 ft. 8 in. long, 3 ft. 2 in. wide and $1\frac{3}{4}$ in. thick. The center channel is $\frac{3}{4}$ in. deep and 10 in. wide. Top and channel are covered with sheet Monel Metal. The frame is constructed from $1\frac{3}{4}$ in. x $1\frac{3}{4}$ in. x $\frac{3}{16}$ in. angle iron and is 2 ft. 8 in. wide, 6 ft. long and 2 ft. 8 in. high.

Two $\frac{3}{4}$-in. pipes, 6 ft. long, are welded in the frame end top members 13 in. apart, making four socket holes in which the U-shaped box holder is inserted at either end. The box holder is made of $\frac{3}{4}$-in. cold-rolled steel and is 50 in. long, 30 in. projecting—enough to hold two boxes. When not in use it may be slid in out of the way. Two 1 in. pipes are welded in the frame end bottom members 14 in. apart and 8 in. from the floor. These are used as foot rests for the operators.—Billie Burgan, San Diego, Calif.

Linen Plastics

SLIDE PLATES often cause trouble. In order to minimize the friction of a slide plate in a case where a wrapped package had to be pushed for a distance of 10 in., a sheet of linen plastic was used, instead of a metal plate, and the stunt worked like a charm. The packages simple skidded across it. Linen plastic is a sheet of linen impregnated with a formaldehyde-phenol compound, such as Durez or Bakelite. It has a mirror-like surface; it is flexible and virtually wear-proof. Because of its low friction potential it will outwear steel or brass.

Marks, Dates, Floor Space

AS chewing gum comes from the scoring machine in the plant of American Chicle Co., Long Island City, N. Y., it is placed on racks and put into a conditioning room. A multitude of these racks, carrying different kinds of gum, are kept in the conditioning room together, and it is necessary to mark their location and date them. To do this, the bays of the room are identified by letters and numerals on the columns, these following a coordinate system (see FOOD INDUSTRIES, December, 1934, p. 534). For identifying racks within a bay, the printed tags are clipped to a wire stretched between the columns. The tags carry the names of the gums and may be moved along the wire to any position within the bay. Small cards with the date stamped upon them are clipped to the larger name cards.

Gold in Them Thar Kinks

CURRENCY may be off the gold standard, but ideas are not. Convert yours to money by sending Food Industries short discussions of methods you have developed for doing things about the plant, with illustrations if possible. For each of these "kinks" printed, $5 will be paid.

BUSINESS TRENDS

Food Consumption Unchanged

THE INDEX of retail food prices of the Bureau of Labor Statistics has declined during the depression from the 1929 average of 156.7 (1913 basis) to a 99.7 average and then increased to over 110 per cent. The decline in total dollar sales over this period has been only slightly greater than the fall in prices, indicating that there has been little, if any, change in the actual quantity of food consumed. In the same period imports of foods declined 49 per cent in value, but about half of this was accounted for by the decline in food prices.

Fats and Oils

DROUGHT and agricultural restriction have combined to cause a sharp increase in the price of both lard and cottonseed oil. As these fats are the principal source of shortenings and cooking oils, there has already been noted a movement to import such oil seeds as sesame, kapok and kaoliang from Asia.

As a further result of this price situation, combined with the high level of butter prices, increased coconut oil imports are to be expected. At former price levels, the taxes levied upon margarine were severe enough to check its use, and the special taxes on coconut oil caused a relatively larger quantity of domestic fats to be used in such oleo as was made. The situation now tends to be reversed, and unless cottonseed oil prices drop to a level near the price of coconut oil plus the special tax, imports of this oil may be looked for to supply the increasing demand for margarine which arises out of high butter prices.

One interesting phase of this situation is the recent increase in the price of coconut oil. Should this trend continue, domestic fats and oils will not suffer as much from foreign competition as had been expected.

Fruits, Vegetables Suffer Freeze

REPORTS from Southern states record serious frost damage to fruit and market crops in January, according to the Bureau of Agricultural Economics. Alabama had about 75 per cent of the cabbage plants already set (comprising 95 per cent of the intended acreage) killed in the freeze. Mississippi cabbage suffered but little, as not much of the crop was set, and the same was true of green peas, little of the intended acreage having been planted.

California reports little damage to any fruits or vegetables. Florida during January, was in the same category, except for some damage to the bean crop. In Louisiana, most tender vegetables were completely destroyed, other truck crops suffered greatly, while strawberries were not much hurt.

Texas experienced the most severe damages, temperatures going as low as 16 around Houston, and Brownsville having a low of 26 deg. F. All beans that were up were killed. Beet loss was about 65 per cent. Cabbage suffered damage running from 75 to 100 per cent, depending on locality. Carrot loss varied up to 50 per cent, with locality. All corn in the Rio Grande valley was killed. Little loss to onions is reported, except to plants transplanted to north Texas, which were killed. Spinach tonnage was reduced by 55 per cent.

Fifty per cent of Texas canning and freezing pea acreage was between blossom and harvest stage, and was killed; but about 1,000 acres remain which were just coming through the soil.

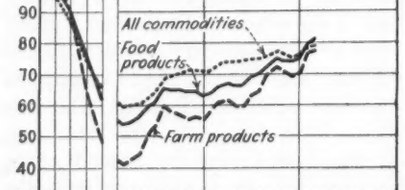
Texas strawberries were delayed but not killed, it being estimated that there would be no fruit before March 1. Practically all of the tomatoes were killed.

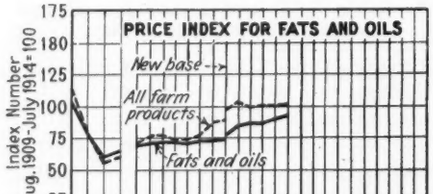
Fruit trees in the Rio Grande valley escaped damage by reason of the freakish weather, very little damage occurring above 3 ft. from the ground. Citrus production in the valley, low this season because of hurricane damage in September, is privately forecast at 2,500,000 boxes of grapefruit and 300,000 boxes of oranges, compared to the Government forecast of 2,276,000 and 535,000 boxes, respectively. Production in 1935-36 is forecast at 6,000,000 boxes of grapefruit and 1,000,000 boxes of oranges.

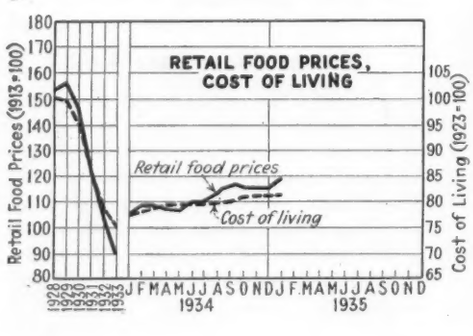
Butter at Import Level

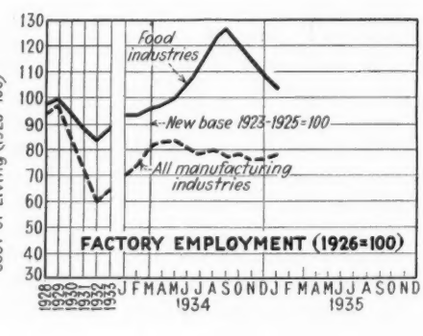
THROUGH most of February, the spread between the price of butter in the United States and the price of New Zealand salted in London continued around 16 cents, or in excess of the 14 cent tariff. Argentine butter began to reach the United States as well as that from New Zealand. According to the *New York Journal of Commerce*, imports during February are estimated at from 65,000 to 70,000 packages. Butter prices rose somewhat through the month, with foreign following, but maintaining the spread.

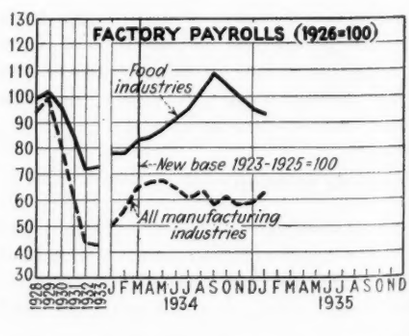
Storage stocks are at a low ebb, and while there has been some increase in production in recent weeks, it has not yet reached levels that affect the market greatly, and is still far below production for the same weeks of 1934.











Business Declines

CONFLICTING factors in general business activity have called a halt in its continued upward climb. According to the *Business Week* index this activity reached a peak of 65.9 per cent of normal for the week ended Feb. 2 and turned downward. As we go to press it stands at 63.2 per cent, a decline of 4.10 per cent from this peak.

UNCERTAINTY over the delayed gold-clause decision, the next turn in NRA affairs, and the handling of the vast work relief fund now before Congress has curtailed commitments. However, steel and automobile production activity continues, with commodity prices faltering and with food prices holding at their advanced levels.

WHOLESALE PRICES reported by U. S. Department of Labor for foods rose 4.13 per cent between Jan. 19 and Feb. 16; farm products followed with a 3.26 per cent increase in price and all commodities trailed with a 1.15 per cent advance.

NEW YORK *Journal of Commerce*, in its weighted price index, reports a 1.0 per cent decrease in general index, 0.91 per cent for grains, and no change for foods during the month ended Feb. 23.

NOTWITHSTANDING meat prices shooting to higher levels, fish interests are not enjoying profitable prices. Holders of canned foods have found their stocks in demand as prices of fresh fruits and vegetables soared because of freezing weather damage. But, because the damage is not as great as at first thought, fresh vegetable prices have broken.

A disturbing factor to the butter market are the reports in general trade news of greater demand for oleo in the larger cities. This continues a trend which increased oleo consumption in 1934 by 8.3 per cent over 1933.

Ice Cream Sales Better

FOR THE first time since 1929, ice cream sales in the United States in 1934 showed an increase over the preceding year. Comparisons, made by the International Association of Ice Cream Manufacturers, are based on results of sales in the first eight months of each year. On this basis sales in 1930 fell off 5.2 per cent from 1929; in 1931, 13.81 per cent from 1930; in 1932, 22.83 per cent from 1931; in 1933, 11.47 per cent from 1932. In sharp contrast to this, 1934 sales rose 18.2 per cent over those of 1933. While the increase was only 1.97 per cent in Illinois, and ranged all the way up to 43.87 per cent in Michigan, it is significant to note that every state in the Union recorded some gain.

Sugar Consumption Declines

FALLING OFF in sugar consumption in the United States, a trend that started in 1930, continued during 1934. According to a Willet & Gray report, total consumption last year was 5,134,746 long tons, approximately 2.6 per cent below 1933. Per capita consumption fell in the same period from 93.6 lb. to 90.7 lb.

This is in contrast to the trend in Europe, where, in the fourteen principal consuming countries, 7,467,764 long tons were consumed in 1934, an increase of 3.8 per cent over 1933, according to Lamborn & Co. Along with this increase has gone an increase in the export of refined sugar by the United States. In 1934, sugar shipments abroad increased by 169 per cent over 1933, reaching 122,413 long tons, greatest since 1927 when 126,138 long tons were shipped.

With carryover stocks low and United States consumption likely to increase, the outlook for sugar in 1935 is considered by some market authorities to be the best in 10 years.

INDICATORS

ADVERTISING volume, reflecting improved business conditions, rose 16 per cent in 1934, *Printers Ink* reports.

EASTERN VINEYARDISTS are substituting wine varieties for table grapes, the reverse of what is now taking place in California.

FISH supply remains plentiful as indicated by the Bureau of Fisheries' latest reports of New England landings, 39 per cent above those of last year. The February catch is probably a record for that month.

FEED shortage in the United States has already resulted in the importation of foreign feed stuffs, among which a total of 20,000,000 bu. of corn, 40 per cent beyond all previous records, is expected to come in, according to the Department of Agriculture.

BEET PACK, at 2,196,116 standard cases in 1934, was twice as large as the 1933 pack, and also larger than 1931 or 1932 production.

TOMATO JUICE CANNERS, in 1934, packed a total of 5,578,572 cases, all sizes, including 435,256 cases packed in glass.

FRESH LIMA BEAN PACK figures for 1934 have been revised by the National Canners' Association, the new total being 1,319,203 standard cases.

SPINACH PACK, 1934 fall production, amounted to 349,338 cases, all sizes. Added to the previously reported spring pack, the year's total spinach production becomes 2,909,248 cases, all sizes.

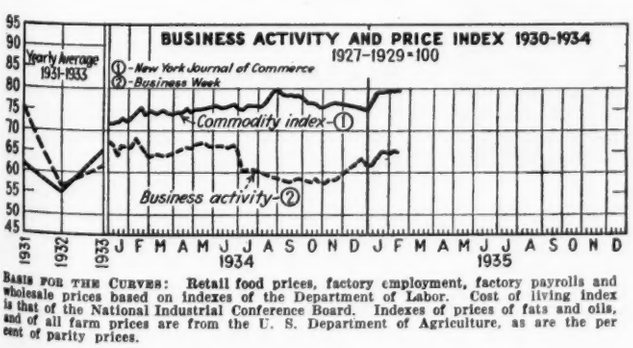
GRAPEFRUIT JUICE is being canned by two Texas concerns on a 24-hour schedule, with juice fruit selling at $3 per ton, in ample supply for capacity operations.

FRESH vegetable supplies from the South, at lower prices during February, reduced the upward pressure on canned foods prices.

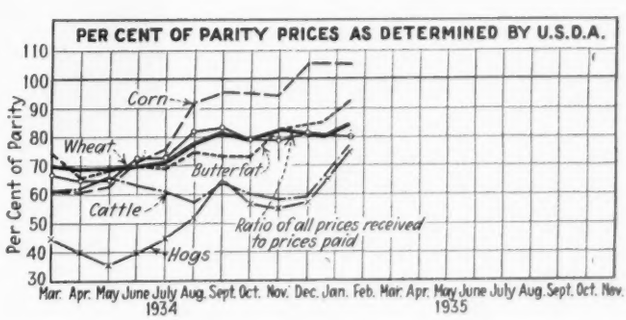
FROST DAMAGE to vegetables and fruits continued in the South, with a Florida freeze in early February causing losses in beans, tomatoes and strawberries.

Construction News

	Pending (thousands)	Awarded February (thousands)	Total Awarded 1935 (thousands)
Bakery	.....	.....	$57
Beverages	$1,172	$708	1,034
Canning and Preserving	130	....	56
Confectionery	28	....	....
Grain Mill Products	85	....	128
Ice, Manufactured	85	....	78
Meats and Meat Products	.....	....	250
Milk Products	435	....	258
Sugar	.....	.....	.....
Miscellaneous	148	144	231
Total	$2,083	$852	$2,092



BASIS FOR THE CURVES: Retail food prices, factory employment, factory payrolls and wholesale prices based on indexes of the Department of Labor. Cost of living index is that of the National Industrial Conference Board. Indexes of prices of fats and oils, and of all farm prices are from the U. S. Department of Agriculture, as are the per cent of parity prices.



KEEPING UP WITH THE FIELD

- ***Two industries get codes; others, amendments***
- ***Senate committee puts brakes on Copeland bill***
- ***AAA bills introduced, have open-book clause***
- ***Ask 10c. tax, 80% fat standard for margarine***
- ***Food industries on long end of Brazil treaty***

More Food Codes; Amendments

WHILE waiting for President Roosevelt to pronounce its own fate, NRA last month approved two more food manufacturing codes, these covering package and process cheese and Pacific Coast dried fruit. Effective Feb 11, the cheese code provides a 40-hour week, a nine-hour day, and a minimum hourly rate of 45c. There is a 10c. reduction for packaging and light work and a 5c. differential in the South. By way of fair trade practices, the code requires the filing of prices. Effective Feb. 5, the dried-fruit code provides for a basic 40-hour week and a minimum hourly rate of 40c. Employees doing light work, however, will be paid only 33 1/3c. And in Washington, Oregon and Idaho, a 5c. differential is permitted. The code establishes the Pacific Coast dried-fruit council as the code authority.

NRA also has approved amendments to the baking and chewing-gum codes. The new baking-code provisions require the independent distributor to return his stale and fresh returns to the manufacturer. The chewing-gum code amendment prohibits employment of a worker for a total time in excess of the code limits, even though he serves more than one employer.

Action on Codes Pending

ACTION on a number of codes is pending. The spice grinders, who do not want to risk the hazard of making the lowest price quotation on every spice a standard for the industry, have petitioned the NRA to delete the open-price provisions of their code. This hazard, according to the code authority, was increased by the fact that the code did not permit replacement value to be used in figuring basic costs.

The spice industry also is troubled with deceptive containers. Twelve concerns recently were reported to be marketing spice in containers over the legal size, and the code authority has set May 1 as a deadline beyond which retail sales of slack-filled containers will invite legal action.

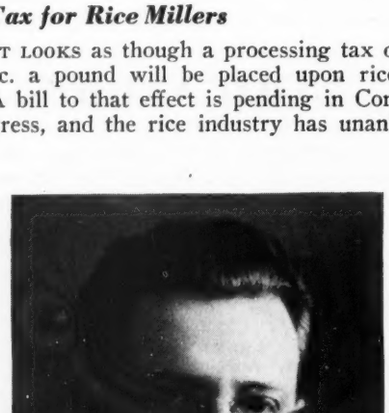
In the confectionery manufacturing industry, the code authority has recognized the existence of an emergency in the jelly-egg division and has petitioned NRA to take immediate action.

Three other industries desire changes in their codes. Cocoa and chocolate manufacturers have asked approval of a standard contract form for sales of bulk cocoa powder in barrels or bags, of cholocate coatings and of chocolate liquors. The macaroni industry seeks an amendment which would prevent any member of the industry from giving prizes, premiums or gifts of intrinsic value.

The pretzel code authority has asked for approval of a proposed budget of $3,082.50 covering the period from Feb. 28 to June 15.

Tax for Rice Millers

IT LOOKS as though a processing tax of 1c. a pound will be placed upon rice. A bill to that effect is pending in Congress, and the rice industry has unanimously endorsed the measure. Moreover, the AAA backs it, Charles G. Miller, head of the rice section, saying it would maintain prices, remove the surplus and result in exportation of some "overstocks". The rice millers also have endorsed a three-year advertising and sales promotion program to be supported by a tax of 3c. a barrel on rice milled.



EDWARD M. JOY
As president of American Society of Bakery Engineers, he will conduct the organization's twelfth annual meeting to be held in Chicago, March 11-14. He invites bakers and allied tradesmen to attend. There will be eleven sessions and three evening events.

Food Bill Sidetracked

SUPPOSEDLY slated for clear and fast sailing through the Senate Commerce Committee, the Copeland bill (S.5) ran into stormy waters Feb. 13. Instead of reporting the measure, the committee ordered public hearings on it.

Just what changes may be made is a matter for speculation. Most of the revisions, up through committee print No. 3, were merely clarifications of the language. In its original form, the bill was acceptable in general to the Department of Agriculture, but W. G. Campbell, chief of the Food and Drug Administration, feels it ought to be made stronger in the interests of the consumer, particularly in regard to information printed on the package. It is significant that President Roosevelt recently expressed favor for a food law with teeth in it. Senator Clark, who heads the subcommittee to hold the hearings, has receded from his past opposition to the bill.

Strong objection to the Copeland measure recently was expressed by American Bakers' Association, which recommended a federal law on food separate from that on drugs and cosmetics.

AAA Bill in Both Houses

A BILL to amend the Agricultural Adjustment Act has been introduced in the House and Senate. It is in a form overcoming objections of last year's adversaries, including Senator Smith, who is sponsoring the Senate bill, and Senator Byrd.

One of the amendments permits benefit payments in kind. As to agreements and licenses, the bill follows the

policies carried out by AAA in its construction of the present act. Authority is granted the President to issue licenses where a group refuses to enter a marketing agreement. *Licensees and parties to marketing agreements are required to permit access to books and records.* Sales quotas or marketing allotments may be set if two-thirds of the producers by volume favor such provisions, and marketing agreements can be terminated if the majority of the producers favor it.

Four Days on Packaging

ADDRESSES summing up advances in packaging in 1934 will feature the first-day program of the conferences and clinics held in conjunction with the Fifth Packaging Exposition in Chicago, March 5-8. Consideration of well designed packages comes on the second day, designated "marketing day." Since packaging is done in the factory, one day, the third, has been set aside as "production day." The utilization of modern packaging in the various industries will be dramatized on the last, "industries" day. A special conference and clinic on packaging and shipping is scheduled for March 7.

In addition to packaging equipment, there will be on display at the exposition the 400-odd packages entered in the Wolf award competition.

Two Bills on Fats and Oils

DOMESTIC producers of fats and oils are out to restrict foreign competition and to increase the amount of fats and oils used. This would be accomplished through two bills introduced in Congress by Representative Richard M. Kleberg of Texas. One bill places a tax of 10c. per pound on all oleomargarine made from foreign oils. The other establishes an 80-per cent minimum fat standard for margarine.

Extension of the three-cent excise tax on cocoanut and other oils to practically all imported oils and fats of commercial value is provided for in bills that have been introduced in Congress by Senator Byrd and Representative Bland, both of Virginia. These bills are presented as amendments to the 1934 Revenue Act.

More Food Legislation

SEVERAL other pieces of legislation affecting the food industries are pending at Washington. A bill by Representative Reilly of Wisconsin provides for stringent regulation of imports of milk and cream and their products. Cash bounties for exports of domestic agricultural products are the subject of a bill by Senator Bailey of North Carolina.

Always howling for more basic commodities, members of Congress seek two additions to the list. Senator McNary of Oregon champions hops. Representative Martin of Colorado is backing dry edible beans. Potato growers want spuds made a basic commodity, and their representatives have met with government officials to develop a bill to that end.

Another legislative measure, introduced in the House by Mr. Dimond, would eliminate the conversion of Alaskan herring into oil, meal or fertilizer by 1939. It would allow no new converting plants in the territory and would curtail the output of present plants between now and 1939. Consolidation of existing laws on standards of fill for containers and standards for till baskets, climax baskets, round-stave baskets, market baskets, drums, hampers, cartons, crates, boxes, barrels and other containers for fruits and vegetables is sought by Senator Byrd of Virginia.

Authority for the Secretary of Agriculture to promulgate embargoes against imports of agricultural products, in cases where there is cause to believe they are infected or infested with contagious disease or injurious pests, is asked by Senator Schwellenbach of Washington. Representative Lloyd has a companion bill in the House.

F. A. CARROLL
. . . urges other states to copy the Massachusetts frozen desserts law.

Model Frozen Desserts Law

A GREAT DEAL of unfair competition has been eliminated and more rigid sanitary standards have been established in the ice cream industry in Massachusetts during the past year. This is the opinion of F. A. Carroll, president of New England Association of Ice Cream Manufacturers, who attributes the improvement to the Massachusetts frozen desserts law. "This law ranks as one of the most progressive pieces of legislation of its kind," Mr. Carroll says. And he hopes that other New England states will follow the lead of Massachusetts.

Good Bargains in Treaties

FOOD-PROCESSING industries stand to gain more than they will lose from reciprocal trade bargaining, judging from the Brazilian treaty. Under this pact the duty was cut 60 per cent on preserved fish; 50 per cent on oat meal; 50 per cent on canned asparagus; 37½ per cent on powdered milk; and 20 per cent on canned fruits and vegetables. And United States' concessions to Brazil will have no important adverse effect upon the industry because most of Brazil's exports are free-list items such as coffee.

In general, food manufacturers are particularly in line to benefit from reciprocal treaties because of organized farm demands to inhibit imports of agricultural products on the one hand and to encourage exports on the other. Where imports are not highly competitive, opportunities exist to reduce the duty on raw materials used by the industry.

Hearings on the proposed treaty with Italy begin March 11. It is expected that that country will seek concessions on such items as olive oil and tomato paste. Hearings on Canada will begin March 18. Wheat, barley malt, pickled or salted fish, maple syrup and sausage casings are among the food imports from Canada. Citrus and other fruits and cottonseed oil are among the exports. Treaties with Belgium, Colombia and several Latin American countries are expected soon. Recent hearings were held on proposed pacts with the Netherlands and colonies whose East Indian trade includes Javanese sugar and spices.

Conventions

MARCH

5-8—Fifth Packaging Exposition, Palmer House, Chicago, Ill. Sponsored by American Management Association, 20 Vesey St., New York, N. Y.

7-9—Canners' League of California, annual, Hotel Del Monte, San Francisco. Preston McKinney, 215 Market St., San Francisco, secretary.

11-14—American Society of Bakery Engineers, Edgewater Beach Hotel, Chicago, Ill. Victor E. Marx, 1541 Birchwood Ave., Chicago, secretary.

APRIL

28-30—Bakery Sales Association, Ambassador Hotel, Atlantic City, N. J. Russell Elmquist, 1135 Fullerton Ave., Chicago, secretary.

—American Dry Milk Institute, annual, Bismarck Hotel, Chicago. Roud McCann, 221 N. La Salle St., Chicago, director.

Biscuit Strike Still On

IN EFFECT almost two months, the strike of National Biscuit Co. workers had not yet been settled at the close of February. Although the employees had gone back to work at Philadelphia and Newark, the company's plants at New York, Atlanta and York, Pa., were without man-power. Trucks, however, are covering delivery routes in those cities, produce being shipped in from other plants. It has not been possible, though, to meet all orders.

This trouble all started Jan. 8, when the employees at Philadelphia demanded a wage increase in spite of a wage agreement effective until July. Strikes at other plants were sympathetic.

Packers to Cooperate

SEVERAL WAYS in which the direct marketing of livestock can be improved were uncovered in a survey by the Department of Agriculture. And meat packers purchasing livestock direct from producers have expressed their intentions to put all these improvements into effect immediately. These packers, organized under Association to Maintain Freedom in Livestock Marketing, agree to abolish the so-called "board price"; eliminate the practice of "docking" piggy sows and stags; inspect more frequently scale facilities and weighing at interior marketing points; and adopt uniform grade standards.

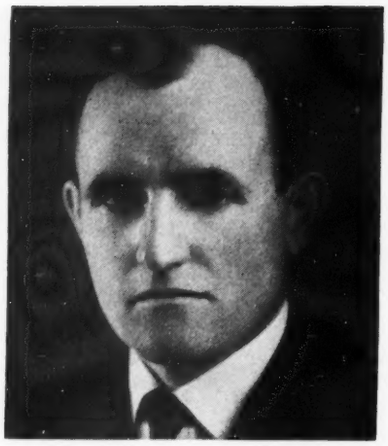
Sewage Legislation Likely

ASSUMPTION of federal control of interstate watersheds to abate stream pollution will be proposed in Congress shortly unless Senator Lonergan, Conn., is assured that the current investigation by the National Resources Board will result in definite recommendations for an effective attack on the problem.

Mr. Lonergan is awaiting a reply from Secretary of the Interior Ickes to a letter in which the Connecticut senator stressed the desirability of getting action. Secretary Ickes recently appointed an advisory committee on stream pollution with instructions to recommend a policy.

Fifty-Hour Milk

MILK more than 50 hours old cannot be sold in Chicago under the rules of the Kelly milk ordinance adopted recently. Deliveries must be made to pasteurizing plants within 24 hours, and the milk must reach consumers within 26 hours after pasteurization. All milk sold in Chicago must measure up to Grade A standards as set forth in the ordinance. The number of bacteria permissible are reduced from 1,000,000 to 200,000 per c.c. in raw milk; 100,000 to 30,000 in pasteurized milk; and 300,000 to 60,000 in cream.



F. W. HUNTZICKER
He heads up the recently organized Wisconsin Cheese Producers' Federation, which has taken over the business of National Cheese Producers' Federation. The national federation discontinued activities after the court ruled it could not collect over-payments to member factories.

Men for the Codes

NRA last month approved a new code authority for the canners and trade practice complaints committees for the bottled-soft-drink and spice-grinding industries. The members:

CANNING

Ralph O. Dulany, John H. Dulany & Sons, Fruitland, Md.; Walter Graefe, Pomona Products Co., Griffin, Ga.; Francis A. Harding, Wm. Underwood Co., Watertown, Mass; William H. Ritter, P. J. Ritter Co., Bridgeton, N. J., and E. S. Thorne, Geneva Preserving Co., Geneva, N. Y.

Fred B. Childs, Libby, McNeill & Libby, Chicago; Frank Gerber, Fremont (Mich.) Canning Co.; B. F. Julian, Marshfield (Mo.) Supply Co.; W. A. Miskimen, Stokely Bros. & Co., Indianapolis; and A. F. Shroder, Wisconsin Canning Co., Winneconne.

Elmer E. Chase, Richmont-Chase Co., San José, Calif.; Karl K. Mayer, Kuner-Empson Co., Brighton, Colo.; Robert C. Paulus, Paulus Bros. Packing Co., Salem; L. B. Sammis, Rocca Bella Olive Co., Wallace, Calif.; and Harry A. White, California Packing Corp., San Francisco, Calif.

BOTTLED SOFT DRINKS

Charles V. Rainwater, Coca-Cola Bottling Sales Co., Atlanta; Wm. B. Hatfield, Hatfield & Bell, Brooklyn, N. Y.; James Vernor, Jr., James Vernor Co., Detroit; J. B. O'Hara, Dr. Pepper Co., Dallas; and Frank P. Carr, Philadelphia.

SPICE GRINDING

Norman S. Dillingham, D. & L. Slade Co., Boston; Charles A. Thayer, R. T. French Co., Rochester, N. Y.; John Max Weyer, Van Loan & Co., Inc., New York; J. Bosley Bond, Wixon Spice Co. Chicago; Wm. G. Volkmann, A. Schilling & Co., San Francisco; J. E. Tone, Tone Brothers, Des Moines; and T. A. Crawford, Jr., R. J. Thornton Co., Louisville.

Metallic Milk Unsafe

CONTAMINATION of milk, as well as other foodstuffs, by metals is directly associated with skin diseases and neurological disorders. That is what Dr. L. Edward Gaul, a dermatologist, told delegates at the annual meeting of the Metropolitan Certified Milk Producers in New York, Feb. 4. Another speaker at this meeting, John L. Rice, commissioner of health in New York City, stressed the value of milk as a vehicle for vitamin D.

Better Sugar Beets

AMERICA'S beet sugar industry apparently has received a boost in a new strain of beet seed. Officially designated U. S. No. 1, the seed not only produces a beet resistant to curley top and white fly, but it can be grown cheaply enough to compete with commercial seed grown in Europe. As to sugar content, beets from the new seed have practically the same value as has those from commercial seeds. The method of growing the seed is revolutionary. The customary way is to harvest and silo mature beets through the winter and replant them the second year. But the U. S. No. 1 beets are left in the ground through the winter.

Concentrates

THE AAA is not considering abandonment of any of its crop programs, so there is little chance of any processing taxes' being abolished. . . . Means of financing industrial loans for machinery replacement and plant repairs through FHA is provided in the HOLC bill in the House. . . . Plans for a cooperative dairy are being made by several groups of independent grocers in Baltimore.

SERIAL, comic-strip bread wrappers are barred by National Bakers' Council as a violation of the code. . . . The schedule of simplified glass containers for mayonnaise and kindred products has been revised to include the 4, 8, 16, 32 and 128-oz. sizes. . . . Increasing imports of low-grade flour, bran and standard middlings from Argentina, Brazil, Italy and other countries is viewed with some alarm by millers.

THE SHELLFISH industry of Massachusetts is said to have benefited by $1,000,000 through the use of $100,000 of CWA and ERA appropriations for exterminating enemies of the fish. . . . All manufacturing confectioners with annual sales exceeding $7,000 will be covered in a candy sales survey being conducted by the Department of Commerce.

NATIONAL CONFECTIONERS' ASSOCIATION will hold its annual convention June 3-7. . . . The actual cost to industry of administering all NRA codes has been placed in the neighborhood of $41,400,000 a year with an average assessment rate of not over 10/65 of 1 per cent of the volume of sales. . . . Beet sugar production was stepped up 40 per cent and butter production 5 per cent in Russia in 1934. . . . One part of copper in 40,000,000 parts of butter has a measurable effect on the keeping qualities of butter, according to a research food chemist in London.

NEWS ABOUT COMPANIES

Food Industries

• AMERICAN CONE & PRETZEL Co. has purchased Wisconsin Cone & Pretzel Co., West Allis, Wis., and has also leased a new building at Newark, N. J.

• ARMOUR & Co. has begun construction of a $1,000,000 beef house at Chicago. It will be the largest and most modern unit of its kind in the world, having a capacity for handling 20,000 cattle a week. Armour recently purchased the plant of Floydada (Texas) Creamery Co. and is planning to establish a cheese factory at Woodbury, Tenn.

• BRANDLE & SMITH Co., Philadelphia, recently was taken over by Luden's, Inc., Reading, Pa.

• BLOCK CANDY Co., Atlanta, has moved into a modern new plant with 42,000 sq.ft. of floor space.

• CONTINENTAL CAN Co. has purchased the four plants and equipment of Grimes Canning Co., Des Moines.

• CUDAHY PACKING Co. has acquired control of six packing plants operated by Victoria Cold Storage Co. in Victoria, Edna, Goliad, Cuero and Yorktown, Texas, and will enlarge their facilities.

• ALLEN CUTLER, Palo Alto, former executive of Suttern cannery and California Packing Corp., plans a $300,000 cannery at Mountain View, Calif., to pack about 500,000 cases a year.

• GRIESEDIECK BROS. BREWING Co., St. Louis, is spending about $75,000 for improvements in storage, refrigeration and office facilities.

• C. S. KALE CANNING Co. has purchased the Everson (Wash.) plant of Carnation Co.

• KEMP BROS. CANNING Co., of Frankfort and Kokomo, Ind., is locating a plant at San Benito, Texas.

• KRAFT-PHENIX CHEESE CORP., Chicago, will spend $1,000,000 in new plant construction. This building program includes enlarged production facilities in all parts of the country. New cheese making units are under construction at Freeport, Ill.; Plymouth, Wis.; Atlanta; Denison, Tex.; San Francisco; and Montreal.

• MOSELEY CANNING Co., Roanoke, Va., is establishing a plant at Brownsville, Texas, to can tomatoes.

• PYRAMID SOYA PRODUCTS Co., Homewood, Ill., is packing toasted soya beans in transparent cellulose bags.

• RATH PACKING Co. has opened a new plant at San Antonio, Tex.

• SAWYER BISCUIT Co., Chicago, now is oven-dating its Saltine packages and taking them out of dealers' stocks after four weeks.

• SCOBEY FIRE-PROOF STORAGE Co., San Antonio, Texas, is building a $50,000 egg factory for Joe Lowe Corp.

• SPENCER KELLOGG SONS, BUFFALO, reports sales 50 per cent ahead of last year.

• UNITED FRUIT Co. has almost completed plans for a $150,000 banana discharging terminal at Los Angeles.

• VITACUBE Co., Detroit, is experimentally distributing fresh vegetables in small cubes packed in one-pound transparent-cellulose packages.

• THOMAS J. WEBB Co., Chicago, has introduced a half-pound vacuum can of coffee.

• GEORGE WESTON, LTD., has opened a Chicago office under the management of H. C. Neill.

• WINORR CANNING Co., Circleville, Ohio, will build a fourth factory at Wauseon, Ohio.

Associated Industries

• AMERICAN ROLLING MILL Co. has appointed Central Steel & Wire Co., with warehouses in Chicago, Detroit and Dayton, and Edgecomb Steel Corp., Newark, N. J., as distributors of Armco stainless steel.

• ELGIN (ILL.) SOFTENER CORP. has taken over the Isometer, a new flow meter, developed by Isometer Corp., Milwaukee.

• READ MACHINERY Co., INC., announces appointment of Roscoe Martin as manager of its New York service and sales office.

• SARCO Co., INC., has opened a branch office at Newark, N. J., with Walter Andrews and H. W. Angelery in charge.

• S. K. F. INDUSTRIES, INC., has opened a branch at Minneapolis with A. Kishkunas in charge.

• WILSON & BENNETT MANUFACTURING Co. announces the appointment of James H. Brown as sales representative in Toledo.

DEATHS

• DR. ARTHUR P. BRYANT, 67, vice-president in charge of operations of Clinton (Ia.) Co., Feb. 3.

• FRANK A. BURGESS, 80, retired, for 50 years with Batchelder & Snyder Co., Boston, Jan. 29.

• J. W. CUYKENDALL, 87, owner of canning plants at Atlantic, Ia., and Fremont, Neb., Feb. 7.

CHARLEON M. LESTER
Head of the carcass-beef division of Swift & Co., Chicago, and with that concern 45 years, Feb. 1.

• GEORGE EBINGER, 76, founder of Ebinger Baking Co., Brooklyn, N. Y., Feb. 16.

• A. K. JOHNSON, 46, manager and vice-president of Van Camp Sea Food Co., San Diego, recently.

• W. E. HALEY, 70, for many years president of Dairy Delivery Co., Inc., San Francisco, recently.

• WILLIAM B. KLINKE, SR., 75, vice-president of Klinke Bros. Dairy & Ice Cream Co., Memphis, Feb. 10.

• JAMES T. LARMORE, 79, retired, founder of two St. Louis ice cream companies and in the dairy business since 1879, Jan. 25.

• W. D. LIPPITT, 50, president of Great Western Sugar Co., Denver, Feb. 17.

• J. BERT PHILLIPS, 58, secretary and treasurer of Baum Phillips Packing Co., Danville, Ill., Feb. 5.

• JOHN M. PROPHET, 78, former head of Snider Packing Corp., Rochester, N. Y., and for half a century a national figure in his industry, Feb. 15.

• FREDERICK WEEKES, 90, associated with Gus Swift in founding Swift & Co., and long head of a packing establishment in Providence, R. I., Feb. 5.

PATENTS

Ice Cream Bricks Formed and Wrapped Automatically—Leslie A. Mapes, Palisade, N. J., to Borden Co., New York, N. Y. No. 1,986,589. Jan. 1, 1935.

Drying Frame for Gelatin and Similar Materials—Thomas Briley Downey, Haddonfield, N. J., to King & Knox Gelatin Co., Camden, N. J. No. 1,986,716. Jan. 1, 1935.

Method of Coloring Butter—Leon Adler, St. Louis, Mo. No. 1,986,783. Jan. 8, 1935.

In Sugar Manufacture, Raw Juice Treated With 0.15 to 0.05 CaO and Subsequently With 65 to 75 Grams Ammonium Carbonate per 250 cu.ft. of Juice to Secure Lime Separation and Carbonation — Charles Schwieger, deceased, to Schwieger Chemical Co., Inc., San Francisco, Calif. No. 1,986,858. Jan. 8, 1935.

Stuffing Sausage Into an Elastic Tubular Casing so as to Establish a Constant Contact Between the Meat and the Casings—Charles T. Walter to Swift & Co., Chicago, Ill. No. 1,986,868. Jan. 8, 1935.

Dried Milk and Molasses in Powdered Form Used as Ingredients in Insecticidal and/or Fungicidal Dusting Powders—William A. Forbes, San Francisco, Calif. No. 1,987,005. Jan. 8, 1935.

Solid Food Sterilized by Contact With Hot Liquids Under Pressure With Subsequent Removal of Liquid and Release of Pressure to Permit Cooling—Oswald H. Hansen, Cedarburg, Wis. Nos. 1,987,824 and 1,987,825. Jan. 15, 1935.

System for Washing and Sterilizing Milk Pasteurizing Apparatus Between Emptying and Refilling Operations—Charles North, Montclair, N. J., to the Creamery Package Manufacturing Co., Chicago, Ill. No. 1,987,865. Jan. 15, 1935.

Honey Granulated Into a Fine Grain Sponge-like Texture at Approximately 75 Deg. F.—Elton J. Dyce to Cornell University, Ithaca, N. Y. No. 1,987,893. Jan. 15, 1935.

Carotene Precipitated From Carrot Oil by Use of Normal Propyl Alcohol—Harold M. Barnett, Mayfield Heights, Ohio, to the S. M. A. Corporation, Cleveland, Ohio. No. 1,988,031. Jan. 15, 1935.

Vitamins A and D Concentrates Prepared From Yellow Palm Oil—Albert F. O. Germann to S. M. A. Corporation, Cleveland, Ohio. No. 1,988,969. Jan. 22, 1935.

Coffee Concentrates Obtained by Pressing Aqueous Extracts From Coffee Solids—Otto Paul Curt Bredt, New York, N. Y., to Straightway Coffee, Inc., Keyport, N. J. No. 1,898,077. Jan. 29, 1935.

Citrus Fruit Juices Sterilized by Heating From 155 to 175 Deg. F. While Flowing in a Continuous Stream—Harold H. Browne, Brooklyn, N. Y., to the Hills Bros. Co., New York, N. Y. No. 1,989,399. Jan. 29, 1935.

Process for Preparing Ready-To-Eat Wheat Cereal—John L. Kellogg, Chicago, Ill., to Associated Patents, Inc., Kalamazoo, Mich. No. 1,989,480. Jan. 29, 1935.

Suspensing Chocolate Solids in Milk by Addition of 1 to 3 per cent of Starch and 0.01 to 0.2 per cent of a Stabilizing Gum and Heating to Gelatinize the Starch—David E. Linn, La Grange, Ill., to International Patent Development Co., Wilmington, Del. No. 1,989,758. Feb. 5, 1935.

Process of Preparing Dry Pre-Cooked Cereal Gruel Base—Lambert E. Johnson, Nathan F. True and Harry H. Engel to Mead Johnston & Co., Evansville, Ind. No. 1,990,329. Feb. 5, 1935.

Process for Manufacture of Flaked Cereals—John L. Kellogg, Chicago, Ill., to Associated Patents, Inc., Kalamazoo, Mich. No. 1,990,382. Feb. 5, 1935.

Method for Recovering Invertase From Yeast—Leo Wallerstein to Wallerstein Laboratories, Inc., New York, N. Y. No. 1,990,505. Feb. 12, 1935.

Fresh Fruit Juices Extracted Out of Contact With Air—Edward C. Eberts, Jeffersonville, Ind. No. 1,990,779. Feb. 12, 1935.

Egg Meats Forced Through Filter Preliminary to Canning—William L. Loma, Chicago, Ill. No. 1,991,164. Feb. 12, 1935.

Casein Extracted From Milk by Use of 0.1 per cent of Locust Bean Powder and Heating to 150 Deg. F.—Arthur S. Ambrose to Kraft-Phenix Cheese Corp., Chicago, Ill. No. 1,991,189. Feb. 12, 1935.

Fruit Plant Waste Disposed of by Treatment with Pectase—Gordon Manley Cole, and Howard W. Hall, Corona, Calif., to California Fruit Growers Exchange, Los Angeles, Calif. No. 1,991,242. Feb. 12, 1935.

Temperature and Humidity Control

(Concluded from page 139)

attack by insects, mites and rodents and by rodents in cold storage. It also molds rapidly when moistened. Dried fish may be fumigated safely with ethylene oxide mixture and similar gases. Moldy fish is unfit for human food and should be diverted to fertilizer.

Shortenings

CONTAINERS

For lard use steel drums, or when hot, store in tanks.

For hydrogenated vegetable oils use white oak casks.

Hard butters and stearines are packed in paper-lined wooden boxes or slack-coopered barrels.

Oleo pastes are packed in paper-lined fiberboard boxes.

Cocoa butter is packed as individually paper-wrapped cakes in burlap bags.

For coconut oil, steel drums or tight-coopered barrels are used.

Cottonseed and salad oils are contained in cans, steel drums, or tight-coopered barrels.

SHIPPING

Lard and oleo compounds should be held below 40 deg. F. on long hauls, and on short hauls, or local deliveries, below 60 deg. F. Local deliveries of hot lard in tanks are also made. All other types of shortenings listed here may be shipped at normal temperatures. Careful inspection for damage and leakage should be made when receiving. Lard and oleos are particularly susceptible to rancidity and should always be tested promptly.

STORAGE

Oleo compounds should be held at 32 deg. F. Liquid oils may be held in normal storage for longer periods. Hydrogenated vegetable oils, cocoa butter, hard butters and stearines may be held in normal temperatures for two or three weeks, but cold storage should be used for longer periods.

When lard is received in other forms than hot in tanks, it should be below 60 deg. F. It may be held in a cold room safely for one week if in good condition when received, but if in doubtful condition, or to be held for a longer period, it should be placed in cold storage. Lard should be brought to the liquid state only as required, and not more than three days should be consumed in so doing. The temperature of lard heating rooms should not go above 120 deg. F. Hot lard in local tank deliveries should be used promptly, or chilled.

PEST CONTROL

Shortenings are not usually infested with or damaged by storage pests, except where these may wander into containers or gnaw the bags. Most shortenings, however, are likely to deteriorate through the action of microorganisms, giving the result commonly called rancidity, which is most frequently encountered in lard.

Unclean materials and manufacturing equipment, or reused and improperly cleaned containers, always provide a positive nucleus for the future contamination of lard and other shortenings. Favorable temperatures then determine the speed of rancidity development.

Rancidity is generally evident from its sour, rank odor and may be looked upon as the result of a fat decomposition that changes flavor, odor and food value. Lards with a noticeable rancidity should not be used in the manufacture of foods. They will sometimes have a slight rancidity when received which is not evident by its odor. In an emergency such lard may still be satisfactory if used up promptly. This state is often checked by a comparatively simple chemical test. The procedure is to place about 4 cc. of melted lard in a test-tube, add the same quantity of pure (non-fuming) hydrochloric acid and shake thoroughly. When somewhat cooled, but still liquid, add 4 cc. of ether and again shake thoroughly. After a minute or two the lard and ether will separate. If the lard is free from rancidity the ether will be clear; if not, the ether will vary in color from light pink to red, depending on the degree of rancidity present.